tralac | trade law centre for southern africa | centre de droit commercial pour l'afrique australe | centro de direito do comercio para a áfrica austral

AFRICA REGIONAL WORKSHOP ON WTO NEGOTIATIONS

31 August – 2 September 2005

Cape Town, South Africa

Now what?

Searching for a solution to the WTO
Industrial Tariff Negotiations

Santiago Fernandez de Cordoba and David Vanzetti

HOSTED BY TRALAC AND COMMONWEALTH SECRETARIAT

CHAPTER 1

Now what?
Searching for a solution to the WTO Industrial Tariff Negotiations

Santiago Fernandez de Cordoba and David Vanzetti[1]

ABSTRACT

Industrial tariffs are a key element of the current round of WTO negotiations, and the difficulties in reaching agreement on how to proceed in this area have surprised many. Using the Global Trade Analysis Project (GTAP) model, a general equilibrium model, this chapter analyses various proposals on industrial tariffs. The results show that a simple linear formula with a cap on tariffs can generate similar outcomes to the less transparent formulae using non-linear cuts based on some multiple of the each nation's average industrial tariff. The extent of any exemptions and the inclusion of the proposed complete elimination of tariffs in specified sectors are highly important in determining the degree of ambition. A moderately ambitious liberalization scenario that involves the reduction of trade-weighted applied industrial tariffs from 3 to 0.8 per cent in developed countries and from 8 to 6.1 per cent in developing countries would generate estimated global annual welfare gains of around $100 billion. Developing countries would capture two thirds of these gains. The results also suggest that, in the aggregate, the losses borne by developing countries from preference erosion would be more than offset by market expansion in developed countries, but there are likely to be exceptions in term of specific products and regions, in particular in Sub-Saharan Africa.

Key words: WTO negotiations, trade, industrial tariffs, development, special and differential treatment, CGE modelling,

[1] The views expressed in this paper are those of the authors and do not necessarily reflect the views of UNCTAD or its members. Santiago Fernandez de Cordoba is with the Trade Analysis Branch, UNCTAD (Santiago.Fernandez.de.Cordoba@unctad.org) and is also Special Professor of Economics, Universidad de Navarra, Pamplona, Spain. David Vanzetti can be contacted at david.vanzetti@anu.edu.au. The authors wish to express their appreciation to Veronica Chau, Fabien Dumesnil and Ignacio Casanova for their valuable contributions.

1. Introduction

The WTO negotiations on non-agricultural market access (NAMA) represent an opportunity for negotiators to address the tariff and non-tariff barriers (NTBs) that remain following the implementation of the Uruguay Round. However, for many, the Framework Text that was agreed as part of the "July Package" in 2004 leaves considerable uncertainty about the future direction of the negotiations. An agreement to reduce NAMA barriers could lead to significant gains for developing countries in exports, employment and economic efficiency. However, as this study shows, these gains will entail short-term adjustment costs, such as loss of employment and output in import-competing sectors and loss of government revenue.

Developed countries have lowered their tariff averages considerably since the formation of the GATT in 1947. However, these countries continue to maintain high barriers to many developing countries' industrial exports. On average, the developed countries' weighted tariff on imports from developing countries is twice the average rate they impose on imports from other developed countries. This anomaly results from the fact that developed countries' tariffs are particularly high for goods of importance to developing countries such as low-skill manufactures and processed foods. In addition, tariff peaks and escalation present a serious barrier to developing countries' value-added industries and to product diversification.

Another issue arising from the WTO negotiations is the extent to which commitments being sought from the developing countries will contribute to their economic development. In most economic literature, trade liberalization is believed to bring about an increase in economic welfare, which derives from an improved utilization of scarce national resources.[2] Consumers gain from lower prices and a greater choice. There may also be dynamic gains, producing an even higher rate of economic growth, that derive from what may be perceived as an improved investment climate.

However, there is evidence of possible negative short-term effects if no supportive measures are adopted. This has resulted in a growing body of opinion that liberalization should be accompanied by provisions aimed at facilitating adjustment. However, there is little detailed knowledge of the possible trade-induced adjustment costs or appropriate measures and safety nets that would be needed to reduce transition periods and minimize transitional costs. In addition, there may be externalities associated with fostering industrial production, and this is not well captured in modelling analysis such as that used in this paper (Rodrik, 2001).

In the WTO negotiations, the issues still under discussion include the choice of a tariff reduction modality (formula): sectoral elimination, increasing the binding tariffs, special and differential treatment and less than full reciprocity for developing countries. This study intends to help negotiators address some of these issues.

Countries have made a number of proposals on NAMA, and various scenarios are analysed here using a general equilibrium model. The estimated global annual welfare gains range from $70 billion to $110 billion.[3] This study looks in some detail at estimated labour, output and sectoral changes. The analysis shows that the generally modest overall results conceal important changes in trade and output in individual sectors. Some countries will achieve important gains in key sectors, but

[2] This is a formal result, the magnitude of which depends on the extent of liberalization, certain parameters (elasticities) and assumptions (e.g. economies of scale, intra-industry trade and extent of resource utilization), and the absence of externalities or market power considerations (e.g. the so-called "optimal" tariff).

[3] Similar proposals and their overall economic impact have previously been examined in Laird, Fernandez de Córdoba and Vanzetti (2003), who estimate the potential static global annual welfare gains in the current WTO non-agricultural market access (NAMA) negotiations at $30–$40 billion. Other studies, which introduce assumptions of imperfect competition and encompass services, generate much larger results (Brown, Deardorff and Stern, 2001). In the present study we also include services, as explained below, but we retain the more conservative assumptions of perfect competition and constant returns to scale.

in other countries some sectors will face important adjustments. Moreover, the estimated losses in tariff revenue could have a strong negative impact on government revenues for a number of countries.

The paper is structured as follows: the next section looks at the existing level of protection for non-agricultural products; both tariff and non-tariff barriers are discussed. Sections 3 and 4 examine the state of play of the NAMA negotiations, and the various scenarios analysed in the paper are defined in some detail. Section 5 discusses the implications for existing bound and applied tariffs of the 10 scenarios modelled. Sections 6 and 7 describe the utilization of models for trade policy analysis and the standard Global Trade Analysis Project (GTAP) model used in this study. In Section 8 the results from the simulations are presented in terms of export revenues, imports, government revenues, welfare, labour use and output. The potential gains from bringing the unemployed into the labour force are also discussed. This is shown to have an impact far greater than the efficiency gains that result from an improved allocation of resources. Many developing countries might face difficulties in implementing the tariff reductions proposed in this round of negotiations. Implications and conclusions are drawn in the last section.

2. Existing protection

Several rounds of multilateral trade negotiations have achieved significant reductions in tariffs. They have led to a process of liberalization resulting in: (i) a substantial reduction in overall tariff barriers; (ii) a commitment to keep tariffs below a given level (binding tariff lines); (iii) greater transparency of trade impediments through the conversion of quantitative restrictions to tariff barriers; (iv) a legal framework to minimize the use of policies and measures that unfairly distort trade; and (v) a set of measures and safeguards to provide flexibility to developing countries and least-developed countries (LDCs).

Box 1 Difficulties in measuring protection

There are several difficulties in measuring protection, arising from:

(i) **The distinction between bound and applied tariff rates**
Bound rates are the maximum levels, while applied rates are the rates that are actually imposed. Since developing countries have very high bound rates, there can be a considerable difference between bound and applied rates.

(ii) **Conversion of specific tariffs to ad valorem equivalents**
Ad valorem tariffs are based on the value of the product, while specific tariffs are a set amount, usually for a given quantity of product, irrespective of price. Specific tariffs can be converted to ad valorem equivalents. However, care must be taken when selecting the appropriate base prices to use.

(iii) **Trade-weighted averages**
Averages that are weighted on the basis of trade volumes are often used to indicate levels of tariff protection. However, a problem with interpreting these measures is due to the endogeneity of trade flows; that is, the higher the tariff rates, the lower the trade flows will be. In the extreme, a prohibitive tariff is given a weight of zero. As a result, simple average tariff rates tend to be higher than weighted averages.

(iv) **The influence of preferential tariffs**
Due to the proliferation of regional trade agreements and preferential arrangements for developing countries, a significant share of the world's trade takes place at below most-favoured-nation (MFN) rates; therefore special attention is needed to ensure that the appropriate tariff rates are being measured.

(v) **Shortcomings in using average tariff rates**
Averages do not tell the whole story: they do not capture tariff peaks and tariff escalation that are additional forms of protection. Tariff peaks are tariffs that are greater than three times the national average, while tariff escalation involves an increase in tariff levels with the transformation of a product, resulting in higher tariffs for high value-added products.

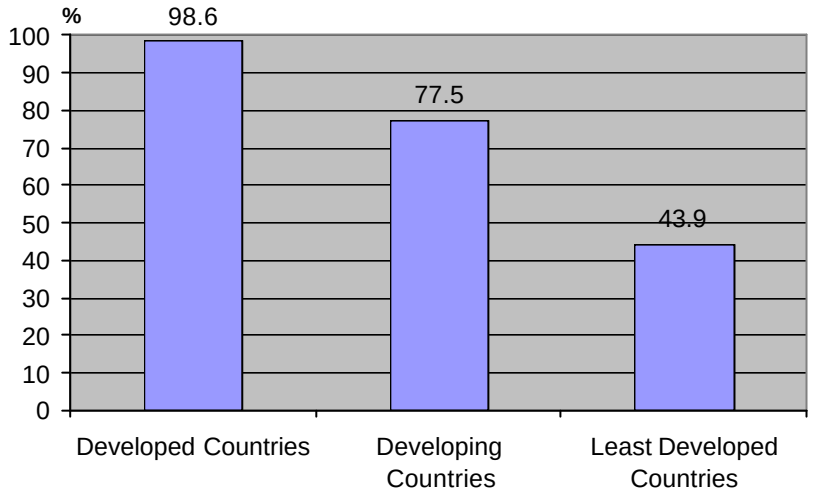
(vi) **Non-tariff barriers**
Assessing the degree of protection afforded by non-tariff measures, such as quantitative restrictions and technical barriers, can often be quite complex due to the lack of reliable data.

2.1 Tariff barriers

2.1.1 Binding coverage

Bound tariff lines are products on which there is a commitment not to increase tariffs above a specified level. The binding of tariff lines makes trade more predictable by reducing the discretionary ability of governments to increase tariffs. The binding coverage (i.e. the percentage of tariff lines that are bound) among developed countries is almost 100 per cent, while among developing countries it is much lower (figure 1), and as low as 10 per cent for some countries. Proposals within multilateral trade negotiations have called for increased binding coverage, especially by developing and least-developed country members. However, increasing the binding coverage can reduce flexibility and raise the level of obligations in future rounds of tariff reductions. Once a tariff line is bound, countries are obliged to subject it to any across-the-board tariff reductions that are agreed within multilateral negotiations. Table A4 in the appendix provides a list of binding coverage per country.

Figure 1. Binding coverage on industrial products

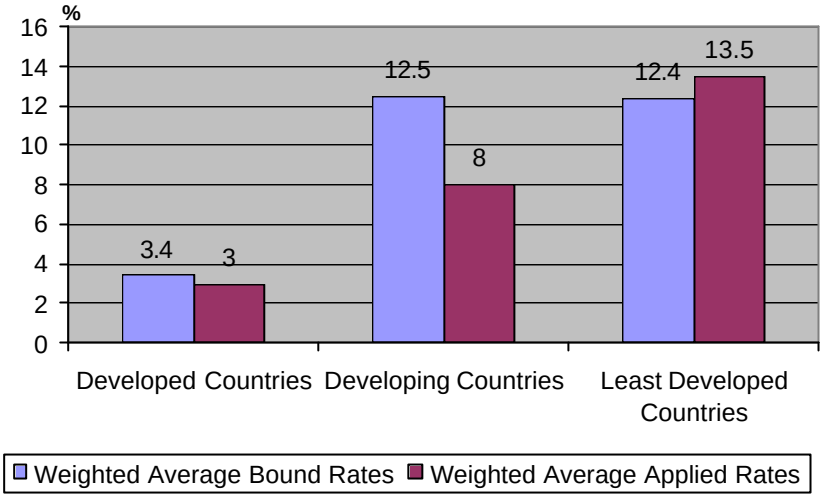


Sources: WITS; WTO CTS database

2.1.2 Average tariffs

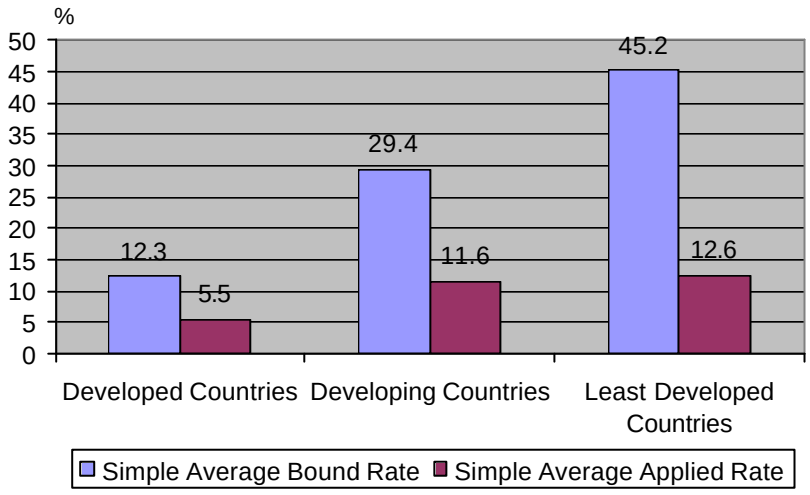
As illustrated in figures 2 and 3 below, average tariffs are higher in developing countries and LDCs than in developed countries. However, among developed countries there are still significant tariff barriers in some sectors, resulting in tariff peaks and tariff escalation. There is also a substantial difference between the trade-weighted and simple average rates. This is an important consideration with respect to the various binding coverage and tariff reduction proposals that use average rates as their benchmark. Historically, weighted averages have been used for WTO negotiations.

Figure 2. Trade-weighted bound and applied average industrial tariffs



Sources: WITS; UNCTAD TRAINS database; WTO CTS database.

Figure 3. Simple bound and applied average industrial tariffs



Sources: WITS; UNCTAD TRAINS database; WTO CTS database

Further insight into the nature of existing tariff protection can be obtained by examining tariff rates applied on products from groups of countries (e.g. developed, developing and LDCs). Table 1 shows that developed countries impose tariffs on imports from developing countries that are twice as high as those from other developed countries (2.1 to 1.3 per cent), and their tariff rates on imports from LDCs are three times as high. These tariffs are insignificant on average, but fairly high on a few items.

Table 1: Average applied tariff rates by country grouping (%)

	Exporter		
	Developed country	**Developing country**	**LDC**
Importer			
Developed country	1.31	2.12	3.05
Developing country	9.00	6.26	6.33
LDC	10.88	14.79	9.95

The degree of dispersion of applied tariffs on industrial products indicates potential distortions. Significant dispersion within a customs schedule is generally seen as undesirable, at least by economists. A harmonized schedule, which raises revenue but does not change the relative prices of imported goods, is preferred. There are two useful statistics to measure dispersion: standard deviation and coefficient of variation. The first measures individual variation from the mean, with greater weight put on extreme values. The second merely adjusts the first for scale.

The standard deviation[4] of applied weighted average tariffs on industrial products is higher both for developing countries and LDCs than for developed countries, implying that developing countries and LDCs have a higher degree of dispersion. However, this is partly due to the higher average tariff levels. When the dispersion is normalized by dividing by the mean, the relative dispersion is in fact greater in developed countries.

Table 2. Measures of dispersion of weighted averages ofapplied tariffson industrial products by country grouping

Group of countries	Weighted average applied tariffs(%)	Standard deviation	Coefficient of variation
Developed	3	3	1.00
Developing	8	5.6	0.70
LDCs	13.5	4.2	0.31

Sources: WITS; UNCTAD TRAINS database; UNCTAD analysis.

The coefficient of variation highlights the fact that, although weighted averages on applied tariff rates are much lower within developed countries, there is still significant dispersion within their tariff schedules.[5]

2.1.3 Tariff peaks

Tariff peaks are high tariffs, usually defined as tariffs that are three times the national weighted average. Tariff peaks reduce trade flows, in some cases preventing any trade if their values are very high. As a consequence, trade-weighted averages underestimate the importance of these tariff lines, as the peaks reduce the trade (import) flows. It is also important to note that tariff peaks are defined relative to national averages. Therefore a tariff qualifying as a tariff peak in a country with a relatively low national average tariff might not be a peak in another country with a higher national average tariff.

Table 3. Definition and number of tariff peaks on industrial products

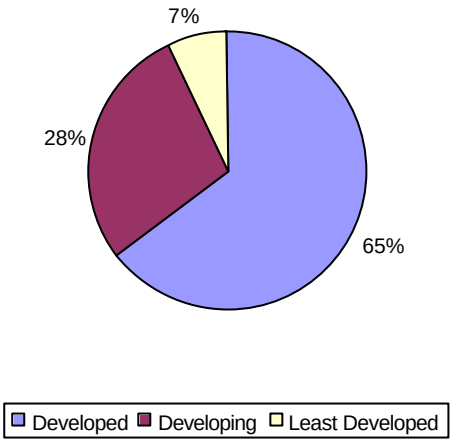
	Applied tariff rates		Bound tariff rates	
Group of countries	Minimum tariff that qualifies as a tariff peak(%)	Number of peaks	Minimum tariff that qualifies as a tariff peak(%)	Number of peaks
Developed	9	338	10.2	185
Developing	24	149	37.5	18
LDCs	40.5	37	37.2	15

Notes: Minimum tariff that qualifies as a tariff peak is equal to three times the average applied rate; number of tariff peaks are at the six digit level of the Harmonized System (HS)
Sources: WITS, UNCTAD TRAINS database; WTO CTS database; UNCTAD analysis.

[4] The standard deviation is defined as the square root of the variance, which is the sum of the square of the deviations between individual values and the mean.

[5] See appendix for complete information on tariff rates, disaggregated by countries.

Figure 4. Distribution of tariff peaks in applied tariff rates



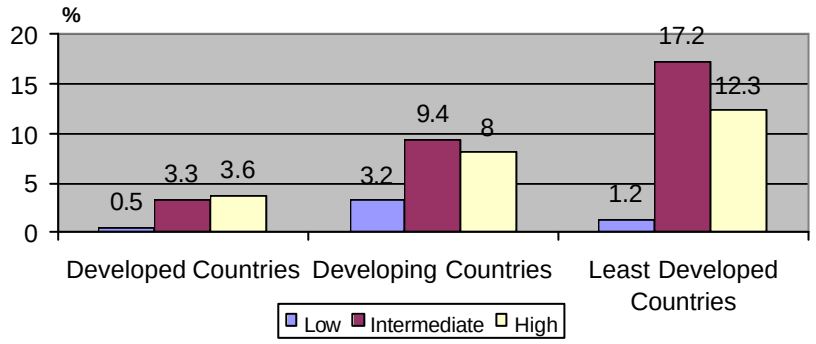
Sources: WITS; UNCTAD TRAINS; UNCTAD analysis.

Tariff peaks in developed countries tend to be imposed on those products of export interest to developing countries such as textiles, apparel and footwear. Therefore, it is important for developing and least-developed countries to ensure that a tariff reduction approach addresses not only average tariff rates, but also tariff peaks in key sectors of export interest to them.

2.1.4 Tariff escalation

Tariff escalation occurs when tariff levels increase with the degree of processing. To assess tariff escalation, it is useful to classify products into three groups: low, intermediate and high value added. Governments have traditionally sought to impose tariffs on highly processed products and zero or very low taxes on raw materials. This affords value-added sectors a higher rate of effective protection than is apparent from the tariff schedule because taxes on input are les than taxes on output. Tariff escalation in developed countries may inhibit the development of value-added industries in developing countries where they might more suitably be located.

Figure 5. Tariff escalation of weighted applied tariffs on industrial products



Sources: WITS; UNCTAD TRAINS

As shown in figure 5, tariff escalation, with tariffs higher for intermediate and final products, is clearly observed in all groups of countries. Among developing and least-developed countries, there is considerable tariff escalation between raw materials/low-technology products and intermediate technology goods, but the extent diminishes between intermediate goods and final products.

2.2 Non-tariff barriers

2.2.1 Concepts

Non-tariff barriers are trade distorting measures and policies other than tariffs. These occur in: (i) administrative procedures and unpublished government regulations and policies; (ii) market structure; and (iii) political, social and cultural institutions. This section focuses on formal non-tariff measures, even though informal ones are also an important means of trade distortion.[6]

Box 2. Scope of the definition of non-tariff barriers

In a narrow sense, non-tariff barriers (NTBs) are quantitative restrictions that are explicitly recognized as trade barriers, such as quotas. These are being converted to tariffs to the extent possible, in order to ensure greater transparency. In a broader sense, NTBs include unfair measures or misuse of policies such as technical barriers to trade and unfair government policies. Other NTBs include illegal practices and violations of the current multilateral trade legislation. There are committees in WTO on Technical Barriers to Trade, Sanitary and Phytosanitary measures and Trade Facilitation, whose objective is the reduction of various NTBs.

The so-called formal NTBs include a wide range of policies carried out by governments to restrict trade. The following classification is not exhaustive, but provides an overview of the different NTBs used by some governments to restrict trade flows. Emphasis is placed on practices the main effect and purpose of which is to restrict trade. These policies can be classified as follows:

- *Quantitative restrictions*. These are procedures governments use instead of tariffs to restrict trade flows. While tariffs act in an indirect manner by increasing the prices of foreign commodities, quantitative restrictions are more precise and less uncertain. However, they generate quota rents, which may accrue to exporters rather than importers, depending on the method of allocation. For this reason, some exporters favour quantitative restrictions over tariffs. The main quantitative restrictions are import quotas, which might be administered through licences or other means. As a result of Article XI of GATT 1994, most quantitative restrictions have been converted into tariffs.
- *Administrative and technical requirements*. Many developing countries and LDCs are preoccupied with the way different legal and technical procedures can be used to restrict trade, especially in industrial products. Technical requirements are domestic regulations on foreign products. These measures can have fair objectives such as achieving quality and safety standards for imported goods, but they can also be used to restrict imports of foreign goods by imposing unfair and excessive requirements. Table 4 presents a non-exhaustive list of the potential areas in which NTBs arising from technical requirements could be found:[7]

Table 4. Non-tariff barriers arising from technical requirements

Customs valuation	Set of measures that check whether the quality, price, origin, and other features of the imports are in accordance with the information provided by the foreign exporter.
Sanitary and phytosanitary measures	Measures that aim to protect human, plant and animal health and safety; for example, to ensure that food is safe for consumers, and to prevent the spread of pests or diseases among animals and plants.
Technical barriers to trade	Technical regulations and standards that set out specific characteristics of a product, such as its size, shape, design, functions and performance, or the way it is labelled or packaged before it is put on sale.

[6] See Deardorff and Stern (1997) for a more detailed explanation of informal NTBs.

[7] For a detailed description of how administrative and technical requirements can represent NTBs, and how this concern was already apparent during the Uruguay Round, it is interesting to examine the Uruguay Round Agreements (see, for example, *A Business Guide to the Uruguay Round* and *The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts*).

The Uruguay Round Agreements included provisions on the so-called technical barriers to entrance, preshipment inspection and custom valuation in general, and sanitary and phytosanitary measures. The challenge now is to identify other NTBs, that contravene WTO guidelines. Once these measures have been identified, determining the negotiating group that should address them has often proved to be a contentious matter.

2.2.2 Level of protection

(i.) There are four main ways of assessing the level of protection afforded by NTBs: *Inventory approach*. This method involves estimating the proportion of trade that is covered by NTBs, or their frequency of application within a particular sector.

(ii.) *Modelling approach*. Estimates can be made of the extent of protection in particular sectors or regions. Based on the modelling of trade volumes and estimates on elasticities, a "price wedge" can be inferred which reveals the impact that the NTB has on the domestic price of the product.

(iii.) *Tariff equivalent or price wedge*. This is the difference between a price of a product under free trade and the domestic price of the good in a protected market.

(iv.) *Subsidy equivalents*. This method involves estimating the transfer of resources from governments to producers through subsidies by tracing government expenditures and then estimating the effects of policies.

Table 5 below provides a frequency-based estimate of the level of protection provided by NTBs.

Table 5. Import coverage of major NTBs in OECD Members

Indicator	Australia		EU		Iceland		Japan		New		Norway		Mexico		Turkey		Switzerland		USA	
	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996	1989	1996
All NTBs	3.4	0.7	26.6	19.1	n.a.	3.6	13.1	10.7	14.1	0.8	26.6	4.3	2	14.1	0.1	0.4	12.9	7.6	25.5	16.8
- Core NTBs	3.4	0.7	25.2	15.1	n.a.	1.5	12.5	10	14.1	0.8	25.2	2.6	2	14.1	0	0.4	3.3	0.2	25.5	16.7
Quantitative restrictions (QRs)	0.5	0	19.5	13.1	n.a.	1.5	11.7	9.2	13.9	0	19.5	2.6	1.9	1	0	0.2	1.7	0.2	20.4	10.9
- Export restraints	0	0	15.5	11.4	n.a.	0	0.3	0	0	0	15.5	1.2	0	0	0	0	0	0	19.5	10.8
- Non-auto licensing	0.5	0	4.4	1.5	n.a.	1.4	8.9	8.6	0	0	4.3	2.6	1.8	1	0	0.2	0.4	0	0	0
- Other QRs	0	0	0.2	0.2	n.a.	0.1	2.8	0.6	13.9	0	0.2	0	0.2	0	0	0	1.4	0.2	6.6	0.6
Price controls (PCMs)	2.9	0.7	12.4	3.2	n.a.	0	0.8	0.7	0.3	0.8	12.4	0	0.1	13.1	0	0.3	1.6	0	17.8	7.6
- Variable levies	0	0	6.3	1.4	n.a.	0	0.8	0.6	0	0	6.3	0	0	0	0	0	1.5	0	0.1	0.1
- AD/CVs & voluntary export price restraints (VEPRs)	2.9	0.4	2.6	0.9	n.a.	0	0	0	0.3	0.8	2.6	0	0.1	13.1	0	0.3	0	0	17.8	7.6
- Other PCMs	0	0.3	4.3	1	n.a.	0	0	0	0	0	4.3	0	0	0	0	0	0.1	0	0	0.1

Source: OECD (1997).

Notes: "Core" NTBs are QRs and PCMs shown in the table, imposed "with the specific intent of modifying or restricting international trade" (OECD, 1997).. Non-core NTBs include automatic licensing and monitoring measures. See OECD (1997) for further details of methodology.

3. WTO negotiations: From Doha to the "July Package"

Given the extent of protectionism still prevalent in both developed and developing countries, there remains considerable scope for further trade liberalization. The WTO Doha Ministerial Conference launched an ambitious programme of liberalization in 2001, which is intended to achieve substantial liberalization in both agricultural and non-agricultural sectors. The Doha Declaration mandated that tariffs and other barriers should be reduced. In particular, special efforts should be

made to take into account the interests of developing countries and LDCs, through measures such as the provision of less than full reciprocity, longer implementation periods and exemptions.

With regard to the non-agricultural market access negotiations, objectives include addressing tariff peaks, high tariffs, tariff escalation and NTBs, in particular on products of export interest to developing countries. The mandate states that all products are to be covered by the Agreement, without a priori exclusions. As in other areas under discussion, the mandate also calls for attention to the special needs of developing countries and the provision of less than full reciprocity in market access reduction commitments on non-agricultural products.

Since the launch of the negotiations, different country delegations have submitted several proposals to the WTO Negotiating Group on Non-Agricultural Market Access. In the lead-up to the 2003 WTO Ministerial Meeting in Cancun, the Chairman of the Negotiating Group on Market Access, Ambassador Pierre-Louise Girard, prepared a draft agreement for a framework for negotiations on non-agricultural market access. This document became known as the "Girard" text (WTO document TN/MA/W/35/Rev.1). The main features of this document include proposals for a “Swiss style” harmonizing formula, a zero-for-zero sectoral initiative in seven key sectors and provisions for special and differential treatment for developing countries (see Table 6 for more details on the major features).

During the Cancun Ministerial Meeting in August 2003 a new draft document was released (WTO Document JOB(03)/150/Rev.2), which came to be known as the "Derbez Text" after the Chairman of that Meeting. Annex B of that document contains a proposed framework for negotiations on non-agricultural market access. This text adopts most of the key features of the "Girard" text, but with a few modifications such as referring only to a "non-linear" formula without reference to a specific formula, and softened language on the sectoral initiatives, with no specific sectors mentioned.

The WTO Cancun Ministerial was unsuccessful in finding an overall consensus, not only on non-agricultural market access issues but also on other, interrelated areas such as agriculture and so-called “Singapore Issues” investment, competition, trade facilitation and environment. As a result, the Derbez Text was not adopted.

Following the collapse of the negotiations in Cancun, WTO negotiators in Geneva began to redefine the Doha Work Programme. These negotiations culminated in the release of the so-called "July Package" adopted by the General Council of WTO in August 2004. This is an agreement on the framework for future negotiations in each of the major areas, and marks a significant revival of momentum of the WTO negotiations. However, several important issues remain unresolved. A formula has yet to be selected. Consensus on participation in sectoral elimination is still lacking. The provisions for special and differential treatment for developing countries need further refinement. No deadlines have been agreed upon for implementation of the Agreement. On a more detailed level, several key questions remain, such as whether trade-weighted or simple average tariffs should be used for binding rate calculations.

Table 6. From the "Girard" text to the "July Package": Evolution of the negotiations of NAMA modalities

	"Girard" text – August, 2003 TN/MA/W/35/Rev.1	**"Derbez" text – September, 2003 JOB(03)/150/Rev.2**	**"July Package" – August, 2004 WT/L/579**
Modalities	Formula approach based on bound tariff rates after full implementation of current concessions. Other modalities to remain as options.	⇨	Insertion of paragraph stating that these are the "initial elements" only
Formula	$T_1 = \frac{(B \times t_a \times T_0)}{(B \times t_a + T_0)}$ "Swiss style" non-linear harmonizing formula. Coefficients based on each country's own average base tariffs.	Reference only to a "non-linear" formula, no specific formula proposed	⇨
Binding	Unbound tariffs to be bound at twice the average applied rate in each country. Countries with less than [35 per cent] binding coverage are exempted from formula cuts and expected to bind [100 per cent] of their tariffs at the developing-country average after full implementation of the Doha Round.	⇨	
Sectoral tariff elimination	The complete elimination of tariffs in seven sectors (electronics and electrical goods; fish and fish products; footwear; textiles and clothings, leather goods; motor vehicle parts and components; stones, gems and precious metals)..	However, the Girard text is cited as the basis for work and it contains the list of sector.	⇨
Special and differential treatment	Longer implementation periods. Some tariff lines to remain unbound or exemption from applying formula cuts for up to 5 per cent of tariff lines. Exemption for LDCs from formula cuts or participation in sectoral initiatives, but they are obliged to substantially increase binding coverage; developed countries could autonomously grant duty/quota-free access to products from LDCs.	Developing countries allowed to reduce formula cuts by up to 50 per cent on up to 10 per cent of tariff lines or up to 5 per cent of tariff lines, exempt from binding and formula obligations.	⇨
Non-tariff barriers	Proposal to identify, categorize and select NTBs that fall within the NAMA negotiating mandate.	⇨	Members encouraged to submit notifications by 31 October, and to continue negotiations on NTBs
Credit for autonomous liberalization		Credit granted to developing countries for post-Uruguay Round autonomous liberalization	⇨

⇨ Signifies that the feature was carried over to the next agreement without substantial modification.

4. The scenarios

Since late 2003 several country delegations have submitted proposals for modalities for tariff reduction. While the "July Package" achieved progress on some issues, there are many that are still unresolved. In this section, we identify each of the major areas under negotiation. These elements then form the basis for various trade liberalization scenarios that are analysed in subsequent sections.

This study has created 10 different scenarios. First, three different formulae are selected, for each of which three "cases" are considered: ambitious, moderate and flexible. These cases are created by varying the tariff cuts, sectoral elimination, binding coverage, exemptions for developing countries and low/nuisance tariff reductions. The tenth scenario is a free trade scenario. We start with a discussion on how to evaluate approaches to liberalization of market access; this is followed by details of the formulae and other elements under negotiation.

4.1 Criteria for assessing an approach

In general, a successful formula is one that leads to a negotiated outcome. At a more detailed level, a successful outcome is more likely if a proposed formula is effective, equitable, flexible, simple and transparent. These criteria are discussed in turn. Tariff reduction modalities in NAMA negotiations should contain at least some of these features.

- Effectiveness

  The main objective of the market access section of the current WTO negotiations is to reduce tariff and non-tariff barriers to trade. All countries would like to see improved access for their goods. Achieving substantial tariff reductions is an important objective for many developed countries.

- Equity

  Ideally, the modalities should lead to tariff reduction obligations that offer an equitable balance between the diverse interests of the Members and stakeholder groups within countries. In this instance, equity implies that the modalities should have a mechanism that provides for special and differential treatment for developing countries, and allows them less than full reciprocity on tariff reduction obligations, as agreed in the DOHA Declaration.

- Flexibility

  There is considerable variation in tariff profiles, both in terms of average levels and variance. Modalities that do not take these variations in original tariff profiles into account may impose significantly higher obligations on some Members than on others. Using modalities that have some element of flexibility built in can help take account of these factors.

- Simplicity

  The modalities should be simple to understand and implement.

- Transparency

  The modalities should be sufficiently transparent to enable each country to reasonably determine what it is gaining from the deal, and its resulting tariff obligations as well as those of its major trading partners.

4.2 The formula

Issue summary

Annex B of the "July Package" states that the approach shall be "non-linear" and that (i) the base year shall be 2001 for MFN bound tariff rates; (ii) all non-ad valorem duties will be converted to ad valorem equivalents on the basis of a methodology to be determined, and bound in ad valorem terms; (iii) HS96 or HS2002 nomenclature shall be used for the negotiations; and (iv) the reference period for import data shall be 1999–2001.

However the July Package did not include a specific formula to be agreed upon. Some of the formulae currently under consideration are variations on a "Swiss" harmonizing formula, and variations on a "Capped formula" in which tariffs are subject to across-the-board uniform cuts, with a capped mechanism based on a multiple of the average applied rates.

The selection of values for the coefficients within a formula approach can have a significant impact on the resulting tariff reduction obligations. Some proposals call for a common set of coefficients to be used for all countries. Other proposals call for different values for the coefficients for groups of countries as a way to build more flexibility into the formula. Some of the options for dividing countries into groups include the following:

- *Most weak and vulnerable*. This separates out the LDCs plus other weak and vulnerable economies (e.g. the G90) for even more generous treatment.

- *Initial average bound tariff rate*. This calls for varying the coefficients in the WTO formula based on the initial average bound tariff rate, so that countries with higher initial tariffs would face less stringent reductions.

- *Capability to adjust.* This WTO formula calls for grouping countries into three categories according to their "capability to adjust and commitments they are willing and able to accept". The categories are "leaders" (smallest coefficient), "adjusters" (moderate coefficient), and "new entrants" (highest coefficient). For a given tariff, countries with the smaller coefficient are obliged to reduce tariff levels more than those with the higher coefficient.

Modelling methodology

Three representative formulae are modelled: the WTO formula, the Swiss formula and the Capped formula. The Capped formula applies uniform reductions to tariffs with a cap at three times the applied rate. This cap has a harmonizing effect and helps address tariff peaks and escalation. The Swiss formula envisages the use of different coefficients for developed and developing countries; scenarios using coefficients based on both simple and trade-weighted averages would be used.

Table 7. Descriptions of formulae to be used in the negotiations

Formula	Explanation
Swiss formula	A harmonizing formula that is effective at reducing tariff peaks and tariff escalations: $T_1 = \frac{(a \times T_0)}{(a + T_0)}$ Where a is the maximum coefficient and no final tariff can be higher than this coefficient.
WTO formula (also known as the "Girard Formula"):	A harmonizing formula with a coefficient, B, that can be varied to reflect different initial tariff levels. $T_1 = \frac{(B \times t_a \times T_0)}{(B \times t_a + T_0)}$ Where t_a is the national average of the base rates, T_0 is the initial tariff rate and T_1 the final rate.
Capped formula	$T_1 = (a \times T_0)$ An across-the-board, uniform reduction in average bound tariff levels with a capped mechanism three times the average national applied rate. Where (1-a) is the per cent of tariff reduction.

4.3. Other elements under negotiation

4.3.1. Binding coverage

Proposals for binding rate coverage vary, with some offering flexibility, while others call for up to 100 per cent coverage. Many developing countries prefer flexibility as opposed to leaving a significant share of their tariff lines unbound. For those tariff lines that are bound, the "July Package" calls for binding rates at twice the MFN applied rate.

Modelling methodology

The rate for newly bound tariffs will vary by scenario. The “ambitious” scenario will bind the tariffs at twice the applied tariff rate. The “flexible” scenario will allow developing countries the added flexibility of selecting either twice the applied rate for developing countries (11.6% x 2= 23.2%), or twice the simple average bound rate (29.4% x 2 =58.8%).

In the ambitious scenario, countries that fall under paragraph 6 of the General Council Decision, with less than 35 per cent of binding coverage (paragraph 6 countries), will bind their tariffs at the simple average bound rate for developing countries (29.4 per cent). The flexible scenario will allow them to bind at twice this amount (29.4% x 2 =58.8%).

Within the negotiations, there are ongoing discussions on the extent to which binding unbound tariffs is in itself a concession, and whether or not reductions should then be applied to the newly bound tariffs. For the purpose of modelling the scenarios, the key question is how to treat the newly bound tariff rates, and whether or not they should be included in the formula tariff reduction approach.

4.3.2. Sectoral tariff elimination

Sectoral tariff elimination, or a "zero-for-zero" approach, involves selecting certain sectors for tariff elimination. Some view this approach as achieving the objective in Paragraph 16 of the Doha Ministerial Declaration, that tariffs be eliminated, "in particular, on products of export interest to developing countries". However, there is also opposition to including this approach as a legitimate modality, and a debate over whether participation in these sectoral agreements should be voluntary or

mandatory. Some proposals call for participation by Members that constitute a "critical mass" of trade in a given area.[8]

The recent "July Package" states that sectoral tariff elimination is a "key element" of the negotiating modalities. As yet, however, product coverage, participation and exemptions for developing countries are still to be negotiated. Least-developed countries would not be required to participate in any sectoral approaches, but instead would be expected to make binding commitments.

Modelling methodology

The scenarios will use the seven sectors listed in the Girard text as possible sectors for elimination of tariffs under sectoral initiatives. These sectors are electronics and electrical goods; fish and fish products; textiles, clothing, footwear; leather goods; motor vehicle parts and components; and stones, gems and precious metals; and textiles and clothing.[9] One scenario will include all countries in sectoral initiatives; another will include developed countries only, while a third will assume no sectoral elimination.

4.3.3 Other tariff reduction modalities

The WTO Members decided in the July Package to pursue a primarily formula-driven approach; but they also agreed that opportunities for supplementary approaches, such as zero-for-zero sectoral elimination, and request and offer, would remain open. The proposal also calls upon developed countries to consider eliminating their low tariffs, but no firm decision appears to have been reached.

Four basic approaches to tariff reduction have been discussed in the negotiations. The main one is the formula approach, which uses an across-the-board formula to determine the obligations of each country. This approach can be effective in achieving substantial reductions in tariffs that would otherwise be more difficult on a request-and-offer basis. A formula approach can also be used to harmonize tariff levels, thus reducing tariff peaks and minimizing tariff escalation. Smaller countries that would not have sufficient leverage at the negotiating table to achieve the same commitments from larger trading partners could also benefit from a formula approach. The challenge, though, is to craft a formula that will be acceptable to the diversity of WTO Members. Due to the wide range of initial tariff regimes, levels of development and capacity of the Members to implement tariff reforms, it has so far been difficult to arrive at a consensus on a final formula.

Among the alternative approaches, request and offer, which was used in the Uruguay Round, has been the most important. In this approach, countries negotiate bilateral market access agreements then extend them to all Members. However, the growing number of WTO Members, and the interest in arriving at equal commitments, has led to a decline in importance of this approach.

Box 3. From request and offer to the formula approach

Current negotiations on tariff reductions rest primarily on a formula approach. From 1948, at the start of negotiations within the GATT, to the Dillon Round, tariffs were negotiated item by item using the request-and-offer approach. Linear tariff cuts, also called a formula approach, were introduced in the multilateral trade negotiations during the Kennedy Round (1963–1967). The Tokyo Round (1973–1979) placed more emphasis on the formula approach, where the Swiss formula was proposed. Although the agreements reached at the end of the Uruguay Round (1986–1994) use the request-and-offer approach, more recent discussions are already about how to find a formula appropriate for all Members. The large number of WTO Members (147) makes the request-and-offer approach difficult, but agreement on a formula that fits all Members is also proving to be difficult. Exemptions from formula-based tariff cuts, elimination of nuisance tariffs, or different coefficients used in a formula are expected to supplement the formula approach and provide adequate flexibility.

[8] See description of Norway's proposal in WTO (2003), Negotiation Group on Market Access – Overview of Proposals Submitted, p. 18, TN/MA/6/Rev.1, Geneva

[9] WTO, *Negotiating Group On Market Access: Report by the Chairman, Ambassador Girard, to the Trade Negotiations Committee*, TN/MA/12, Geneva, 2003.

The low/nuisance tariff elimination approach has also been included in a number of proposals.[10] The debate is over what should be considered a low/nuisance duty. The ad valorem rates cited in the various proposals range from 2.5 per cent (proposed by Oman) to 5 per cent (proposed by the United States).[11] There is also debate as to whether participation in such an initiative should be mandatory or voluntary. However, reducing already low rates could affect effective protection on downstream activity, further distorting the allocation of resources. Moreover, the paperwork to administer a zero rate is similar to that for a higher rate. It is for these reasons that several country proposals call for a better definition of what a "nuisance" tariff actually is.

In addition, several countries have proposed using a mix of the above approaches in order to better take into account the different needs of Members and sensitivies with regard to certain sectors. This is the so-called mixed or cocktail approach.

Modelling methodology

The scenarios will use a formula approach, with some variation in the degree to which countries participate in the reduction of low or nuisance tariffs (e.g. all countries, developed only, or no participation).

4.3.4. Exemptions from the formula

The July Package contains provisions for developing and least-developed countries to be exempted from formula and binding coverage commitments. Paragraph 8 of the July Package proposes two options for flexibility with respect to product coverage:

(i) Reduce formula cuts by up to 50 per cent for 10 per cent of the tariff lines as long as the tariff lines do not exceed 10 per cent of the total value of a Member's imports.

or

(ii) Exempt up to 5 per cent of tariff lines from formula cuts or binding commitments, as long as they do not exceed [5] per cent of the total value of a Member's imports.

The square brackets in the text imply the number within is subject to negotiation. As per paragraph 6 of the July Package, countries with less than 35 per cent of binding coverage on non-agricultural tariff lines would be exempt from formula-based tariff reductions. Under paragraph 9 of the July Package, LDCs would be fully exempted from formula tariff reductions, but would be expected to substantially increase their binding coverage.

Modelling methodology

The scenarios will model option (ii) of paragraph 8. The top 5 per cent of tariff lines in terms of tariff rates will be selected for exemptions. In cases where there are several tariff lines with the same rates, those with the highest tariff revenue will be used.

Countries with less than 35 per cent binding coverage shall be referred to in this document as "paragraph 6" countries. The binding coverage obligations for these countries will be varied within the scenarios (e.g. 90–100 per cent). The scenarios will also vary the binding rates for the unbound tariff lines.

Since the increase in binding coverage expected of LDCs is not well defined, for the purpose of the scenario modelling, the LDCs will be exempted from formula reductions as well as binding

[10] See description of proposals from Albania, Canada, China, Croatia, Georgia, Hong Kong (China), Moldova, Norway, Oman, Singapore and the United States in WTO, *Negotiation Group on Market Access – Overview of Proposals Submitted*, p. 21 TN/MA/6/Rev.1, Geneva, 2003.
[11] China, on the other hand, proposes that developing countries remain free to maintain low tariffs

coverage commitments on the assumption that they will increase their commitments at their discretion.

4.3.5 Credits for autonomous liberalization

A number of proposals have suggested that countries that have undertaken autonomous liberalization should be rewarded with credits that can be used to offset obligations in other elements of the market access agreement. There are various options for determining what the definition of "autonomous" liberalization would mean (i.e. beyond Uruguay Round commitments, or after a certain date)

The fourth indent of paragraph 5 of the agreement proposes that developing countries should be granted credit for autonomous liberalization conducted since the conclusion of the Uruguay Round. One way of implementing this concept is to multiply the coefficients in the formula by a certain amount that reflects the degree to which countries have lowered their applied rates. By increasing the values of coefficients in the Swiss or WTO formulae, the resulting tariff reduction obligations would be reduced. However, most of the autonomous liberalization conducted by developing countries occurred before the conclusion of the Uruguay Round, or in unbound lines.

Modelling methodology

Since these credits are not expected to be of significant value for most developing countries, this element is not included in the modelling.

4.3.6. Simple vs. trade-weighted averages

Paragraph 6 of the July Package calls for the tariffs to be bound at the overall average rate of bound tariffs for developing countries. Historically under the GATT, trade-weighted averages have been used for non-agricultural market access negotiations, although in the Uruguay Round simple averages were used in the agricultural negotiations. Within the current round of WTO negotiations, it is not clear whether trade-weighted or simple averages will be used for the non-agricultural market access negotiations. This can have a significant effect on the outcome of the binding level commitments, as the current simple average of bound tariff rates for developing countries is double that of the trade-weighted average.

Modelling methodology

Since this matter is still unresolved, and can have significant effects on the outcome of the negotiations, the scenarios alternatively use both trade-weighted and simple averages to determine the binding rates.

5. Tariff changes

This section explores the resulting final tariff rates arising from the different liberalization scenarios described above. The changes in both simple and weighted average tariff rates are examined.

The comparison of the initial tariffs and the tariffs arising from the different scenarios provides a useful, although incomplete, guide to the consequences of trade liberalization. Changes in tariffs are grouped by developed, developing and least-developed countries.

Table 8 shows the changes in bound and applied rates for developed countries, table 9 for developing countries and table 10 for LDCs. These tables show the tariff changes after applying the different scenarios described above. It is important to mention that the average tariff depends on the

number of tariff lines that are bound, and varies from one scenario to another, as each implies different binding coverage.

Table 8. Developed countries

A. Changes in simple average industrial tariffs (%)

Developed countries		Bound simple averages			Applied simple averages	
			After			
		Before	Initial coverage	Final coverage	Before	After
Swiss	Ambitious	12.3	1.1	1.1	5.5	0.8
	Moderate		1.1	1.1		0.8
	Flexible		2.9	2.9		2.3
WTO	Ambitious		3.0	2.9		1.6
	Moderate		2.0	1.9		1.3
	Flexible		3.2	3.1		2.2
Capped	Ambitious		2.6	2.6		1.7
	Moderate		2.6	2.6		1.7
	Flexible		4.6	4.6		3.4
Free trade			0	0		0

Source: Derived from UNCTAD TRAINS database

B. Changes in weighted average industrial tariffs (%)

Developed countries		Bound weighted averages			Applied weighted averages	
			After			
		Before	Initial coverage	Final coverage	Before	After
Swiss	Ambitious	3.4	0.5	0.5	3	0.5
	Moderate		0.5	0.5		0.5
	Flexible		1.4	1.4		1.3
WTO	Ambitious		0.7	0.7		0.6
	Moderate		0.5	0.5		0.4
	Flexible		0.8	0.9		0.8
Capped	Ambitious		0.8	0.8		0.8
	Moderate		0.8	0.8		0.8
	Flexible		1.6	1.6		1.5
Free Trade			0	0		0

Source: Derived from UNCTAD TRAINS database.

Table 8A and B shows that the binding coverage in developed countries does not significantly affect the simple average tariffs after applying the various scenarios. This is to be expected, as developed countries have almost 100 per cent of their tariffs bound.[12] Average tariffs in developed countries do not vary too much after applying the various scenarios. All 10 scenarios reduce the initial bound weighted average from 3.4 per cent to less than 1 per cent, except for Swiss flexible and capped flexible, which reduce it to only 1.4 per cent and 1.6 per cent respectively. As maybe observed, it is not the choice of formula, but rather the level of ambition that most affects the final average tariffs.

[12] See appendix Table A4 for initial binding coverage of countries.

Table 9. Developing countries

A. Changes in simple average industrial tariffs (%)

		Bound simple averages			Applied simple averages	
			After			
		Before	Initial coverage	Final coverage	Before	After
Swiss	Ambitious	29.4	8.7	9.1	11.6	5.3
	Moderate		11.1	16.8		7.6
	Flexible		14.6	20.4		9.1
WTO	Ambitious		12.4	12.7		6.3
	Moderate		23.1	29.7		10.4
	Flexible		25.2	31.8		0.6
Capped	Ambitious		11.6	12.1		6.8
	Moderate		16.5	22.3		10.3
	Flexible		18.3	23.9		10.6
Free Trade			0	0		0

Source: Derived from UNCTAD TRAINS database.

B. Changes in weighted average industrial tariffs (%)

		Bound weighted averages			Applied weighted averages	
			After			
		Before	Initial coverage	Final coverage	Before	After
Swiss	Ambitious	12.5	2.6	3.4	8.0	2.5
	Moderate		4.0	6.4		4.0
	Flexible		5.9	9.2		5.2
WTO	Ambitious		3.9	5.0		3.3
	Moderate		9.4	15.3		6.1
	Flexible		10.4	17.1		6.3
Capped	Ambitious		4.4	5.7		3.8
	Moderate		7.0	9.2		5.9
	Flexible		8.2	10.5		6.2
Free Trade			0	0		0

Source: Derived from UNCTAD TRAINS database.

Increasing the binding coverage has implications for the final average tariffs for developing countries where the initial binding coverage and final binding coverage are not the same. This is shown in Table 9A and B (above). In some scenarios, such as the WTO moderate and flexible, the bound weighted average tariff for developing countries actually increases from 12.5 per cent to 15.3 per cent and 17.1 per cent respectively. This is due to an increasing share of tariff lines becoming bound.

It is noteworthy that for developing countries' applied tariffs, the scenarios for the Capped and WTO formulae give similar values. The Capped formula offers the additional benefits of being transparent and simple, two of the key criteria for assessing a tariff reduction approach.

Table 10. Average industrial tariffs in least-developed countries

	%
Initial bound simple average	45.2
Initial applied simple average	12.6
Initial bound weighted average	12.4
Initial applied weighted average	13.5

Source: Derived from UNCTAD TRAINS database

Since LDCs are exempt from tariff reduction formulae no change is evident in their average tariffs. However, it is possible to observe that the initial applied weighted average tariff is higher than the initial applied simple average tariff.

Table 11. Initial and final weighted average applied tariffs by country grouping

		Importer					
		Developed country			Developing country		
	Exporter	Developed	Developing	LDC	Developed	Developing	LDC
Before		1.31	2.12	3.05	9.0	6.26	6.33
Swiss	Ambitious	0.32	0.20	0.01	2.75	2.09	2.20
	Moderate	0.32	0.20	0.01	4.58	3.13	2.84
	Flexible	0.69	0.90	1.04	6.00	3.91	3.28
WTO	Ambitious	0.40	0.24	0.01	3.64	2.65	2.64
	Moderate	0.27	0.16	0.00	7.09	4.46	3.82
	Flexible	0.44	0.45	0.39	7.29	4.61	3.95
Capped	Ambitious	0.45	0.29	0.01	4.20	2.97	2.92
	Moderate	0.45	0.29	0.01	6.85	4.28	3.69
	Flexible	0.70	1.14	1.47	7.21	4.55	3.90

Notes: LDCs are exempted from the table because their tariff regimes do not change.
Source: GTAP simulations.

Disaggregating the changes by country grouping reveals that all three formulae offer developed and developing countries roughly equivalent improvements in market access to developed countries. However, not reflected in the data on tariff averages are the remaining tariff peaks on sensitive products, especially those of export interest to developing countries. Therefore an important issue for developing countries is not necessarily the choice of formula, but rather the extent to which the agreement will address the high tariff peaks on products of strategic importance to their economies. Modelling bilateral trade flows can help identify what is important.

6. Modelling trade policy

6.1 Models as a tool for understanding trade policy changes

Looking at average tariffs provides a good indication of the level of ambition of a proposal. By examining tariff changes at an industry or tariff line level, it is possible to make a reasonable estimate as to their likely effects on the industry's prices and production, consumption, and, perhaps, imports and exports. But looking at tariffs alone is insufficient. Because many firms sell their output to other firms as intermediate inputs, lower prices in one sector are beneficial to downstream sectors. For example, the removal of tariffs on textiles makes a country's apparel sector more competitive. Such interactions should be taken into consideration in assessing a policy change. Where a large number of variables are involved, computational models are necessary to take account of the interactions. Trade models are used to make estimates of the possible effects of changes in trade policy on a number of economic variables, such as exports, imports, tariff revenues, production, prices and welfare. The value of the models is in providing an understanding of the interplay of different economic forces, and in enabling comparisons of the relative impact of different policies. They can often help to highlight unexpected or counter-intuitive outcomes, which can assist policy-makers in their choice of policy options and/or development of support measures.

The next section provides a brief overview of economic modelling and a description of the GTAP trade model used here[13].

[13] Based on an internal note prepared by Sam Laird (UNCTAD) on Modelling.

Economic models are useful, indeed almost essential, for attempting to assess the likely impacts of economic policy changes, such as changes in tariffs or quotas. Because any policy change is likely to have both positive and negative effects, say on government revenues, the overall impact depends on the weights given to various factors. It is difficult to assess the multitude of effects without an accounting procedure of some kind. Economic modelling introduces some behavioural assumptions, for example, that consumers purchase less of a good when its price rises. These behavioural relationships, plus the data, provide the basis for policy analysis. Estimates of some of these relationships are difficult to make and may change over time. Moreover, when coupled with poor data, and perhaps poor estimates of the changes in the policy variables, economic models can lead policy-makers to underestimate or overestimate the actual effects of a proposed policy change. For example, in the Uruguay Round, the changes in applied tariffs, which determine economic impacts, did not match the reductions in the bound rates, and thus some analysts overestimated the likely impacts.

The standard GTAP model used here is a static, multiregion, multisector, computable general equilibrium (CGE) model that assumes perfect competition and constant returns to scale. Bilateral trade is handled via the Armington assumption that differentiates imports by source. Input-output tables reflect the links between sectors. The GTAP is ideally suited for analysis of trade policies, such as the liberalization of industrial tariffs, which are likely to have international and intersectoral effects. The input-output tables capture the indirect intersectoral effects, while the bilateral trade flows capture the linkages between countries. A shock or policy change in any sector has effects throughout the whole economy. Tariff support for one sector, such as textiles, tends to have negative effects on downstream sectors (apparel) by raising prices and costs. Changes in policies in sectors such as steel and petroleum tend to have relatively important economy-wide effects because many sectors use these inputs. Support in one market often has a negative effect on others because each sector competes with the others for factor inputs, capital, labour and land. CGE models attempt to capture these effects. The methodology involves specifying a data set which represents a specific year, postulating a change in tariffs or other policy variable, and comparing the simulated outcome with the base data. Impacts of the removal of trade barriers on trade flows, government revenues, welfare and resource allocation within countries can then be ascertained.

Box 4. Computing changes in welfare using CGE models

After a policy change, it is of interest to determine whether a country or region is better off in some sense. The ability of its citizens to consume is an obvious measure, but less obvious indicators, given greater importance by policy-makers, may include exports, employment or the incomes of the poorest segments of society. National output (gross domestic product) is not a good measure because it fails to account for changes in terms of trade, as does gross national product. It is common in CGE modelling to report equivalent variation: the minimum amount that someone who gains from a policy change would be willing to accept to forgo the change. In most CGE modelling, a single household is postulated, so distributional issues within an economy are ignored.

6.2 Common assumptions and limitations of various models

For a number of years models have been based on the assumption that goods coming from different sources (alternative foreign suppliers, or foreign versus domestic suppliers) are imperfect substitutes. This means that goods such as Canadian and Australian wheat are regarded as different, although substitutable, products. This implies that there is no longer one world price for each commodity, and that a change in relative prices does not lead to a complete switching to the lower cost supplier. Compared with homogeneous product models, this means suppliers have some market power and may gain from limiting exports. A more serious concern is that the degree of substitution determines the distribution of the gains from trade; but the relevant parameters are difficult to measure, and there is little agreement as to what they should be.

In an attempt to make models correspond more closely to the real world, new features have been introduced into them. For example, applied models may incorporate increasing returns to scale

and monopolistic competition. These features tend to produce much larger effects, but the modelling requires additional data (discussed in more detail below).

Trade models are useful analytical tools, but they have certain limitations; this is important to keep in mind when drawing inferences from the results.

Static models do not provide estimates of the adjustment process; they say nothing of the transition between one state and another. Yet the adjustment process is becoming a major concern vis-à-vis international trade, and is often cited as the main reason for the absence of reform. Dynamic models throw more light on the adjustment process, but the results tend to be driven by the underlying assumptions.

A more significant limitation is the inability to capture dynamic gains, the effects on productivity from investment, competition, the transfer of technology and other factors that are associated with trade liberalization. These factors may be as important as the static impacts, but are difficult to estimate.

An obvious drawback of modelling is the quality of the data, be they variables (e.g. trade flows), parameters (e.g. behavioural relationships such as elasticities) or policy variables (e.g.tariff levels). For example, the trade distortions considered are tariffs. The tariffication in the past of NTBs, such as quotas or subsidies, and the reduction of these tariffs has served to heighten the relative impact of the remaining NTBs. These include sanitary and phytosanitary measures and technical barriers to trade barriers, which appear to be gaining in importance, especially in the agricultural sector. Most of these barriers are dealt with outside the NAMA negotiations, but are relevant nonetheless.

Another limitation is that market entry is not always assured, even when formal barriers are lifted. The modelling suggests exports will be based on bilateral tariff changes and the relative costs of production in the various exporting countries, but exports may be limited by supply constraints (ports and roads) or the preferences and practices of large marketing companies.

6.3 The database

The GTAP 6.5 database is used here. The value (of output and trade flows) data relate to 2001 and the behavioural parameters, such as elasticities, are taken from the literature rather than econometrically estimated specifically for use within the model. Input-output data are taken from national accounts and vary from year to year, depending on their availability in particular countries. For this application the bilateral tariff data are taken from the World Integrated Trade Solution (WITS); the UNCTAD Trade Analysis and Information System (TRAINS) database is the source of the applied tariff data; and the WTO Integrated Database provides the bound tariffs. The standard GTAP model also uses data collated by UNCTAD, but it is aggregated in a different way, particularly when converting specific tariffs to ad valorem tariffs. This is more relevant for agricultural than industrial tariffs. Preferences are included in the tariff database, and data for the EU are aggregated to 25 members, with internal tariffs removed. China's tariff data reflect its accession terms, with its average industrial tariffs at 9 per cent. China's textile and apparel exports face tariffs of around 10 per cent in each of its major markets: the EU, the United States and Japan. Quotas on exports to these markets were removed at the end of 2004. The database includes substantial export taxes on Chinese textile and apparel exports to the EU and the United States, reflecting quota rents. However, these quotas are not removed in the simulations, as their removal was agreed to in the Uruguay Round.

Tariff revenues are calculated on the basis of the trade flows and bilateral tariffs recorded in the GTAP database. Regional tariff revenues are shown in appendix Table A5. As a result, the database revenue estimates may not correspond to the revenues actually collected by governments. The data may be biased upwards because the policy database is designed to reflect impediments to trade at the margin, i.e. facing an additional tonne of exports. This is particularly relevant where there are quotas

that determine the tariff rate, implying that the marginal and average tariffs will differ; this applies more to agricultural than industrial tariffs. A further source of error is that countries may not collect the amount of revenue implied by the rates because of smuggling, exemptions, the payment of unofficial fees to obtain preferential treatment, or other administrative lapses. Any overestimation in the initial database implies that the tariff revenue losses in absolute terms will also be overestimated.

6.4 Aggregation

GTAP is a spatial model in that it contains bilateral trade flows and tariffs. This enables us to say something about regional trade agreements and the erosion of preferences. However, it implies a limit to the number of regions or sectors that can be modelled simultaneously. It is not feasible to include all 87 regions and 65 sectors when simulating GTAP. For practical purposes, 20 to 25 regions or sectors are the limit. This version of the model has 23 regions and 23 sectors. The choice of aggregation reflects the questions to be addressed.

Regional Aggregation. Single region models permit additional detail, and may be useful when assessing the impact of exogenous shocks on a single country. For multilateral trade negotiations, a multiregion aggregation is obviously more desirable. The selection of the 23 regions reflects geopolitical groupings. It is desirable to aggregate together countries at a similar stage of development and those with similar rates of protection. The aggregation used here separates the major developed and developing countries, and the available case study countries (Bangladesh, Bulgaria, Malawi, the Philippines and Zambia). The remaining groups are aggregates of developing countries.

Sectoral aggregation. The aggregation chosen here reflects an attempt to separate sectors with high rates of protection, such as textiles, leather, apparel, motor vehicles and electronics. For this application to industrial products, the agricultural and services sectors are highly aggregated into only two and four sectors respectively However, these sectors need to be modelled because resources flow into and out of all sectors, leading to possible second-best effects. This can occur if resources released from the industrial sector are re-employed in a more highly protected agricultural sector, resulting in loss of allocative efficiency.

6.5. Closure

Closure refers to the specification of exogenous and endogenous variables in the model. Exogenous variables are fixed, whereas the endogenous ones vary according to changes in the policy variables. The specification depends on how economies are run, the time horizon envisaged and the particular scenarios to be modelled. Of interest here are the labour, capital and foreign exchange markets.

Labour market. The standard labour market closure specifies that the amount of skilled and unskilled labour is fixed and cannot move between regions, although it can move readily between sectors. Wage rates are assumed to be flexible. This closure is somewhat at odds with reality, given that unemployment varies with the business cycle. In addition, in developing countries in particular, there appears to be a pool of unemployed or members of the labour force that work with low intensity. Previous work by UNCTAD (Fernandez de Cordoba, Laird and Vanzetti, 2004) and others has shown that changes in the amount of labour employed has a far greater effect on output and welfare than merely reallocating resources in response to changes in relative prices. An alternative to the standard closure used in this application is to assume fixed wages and allow unskilled labour use to vary in developed countries. Skilled labour remains fixed. This is based on the inituition that the informal sector in developing countries is characterized by significant unemployment and underemployment. Because the demand for labour is indirectly derived from the demand for labour-intensive goods, liberalization tends to increase employment in developing countries and reduce it in developed countries. Thus, with this closure, developing countries appear to gain more from liberalization at the expense of developed countries.

It could be argued that some developed-country economies which are characterized by rigid wages, such as those of Japan and some EU members, should also be treated in a similar way. However, these economies also have regulations governing the shedding of labour, which restrict downward changes in labour use. In these simulations, the standard closure is applied to these economies.

Capital. Macroeconomic closure refers to the specification of endogenous and exogenous variables to satisfy the balancing of the capital and current accounts (i.e. the difference between national savings and investment must equal exports plus international transfers less imports). The standard GTAP closure assumes that investment adjusts endogenously to changes in savings. The trade balance can vary, so that at a national level the change in exports need not equal the change in imports. An alternative macroeconomic closure used here is to fix the trade balance in all countries except one – the United States. This implies that changes in regional investment must equate with savings to maintain the current-account and the capital-account balance. With the trade balance fixed, there is little change in investment. This assumption can affect the distribution of gains from liberalization.

Exchange rates. Real exchange rates (i.e. adjusted for inflation) are implicit in the model and are assumed to be fully flexible. However, several countries, such as China, have or have had managed nominal exchange rate regimes. A fixed nominal rate implies that adjustment must occur elsewhere, for example in prices, interest rates or employment. If this is ignored in the simulations, the trade flow estimates may be biased.

In summary, we use the standard model closure with two modifications. (1) Real wages of unskilled labour in developing countries are fixed and the quantity flexible. Although not entirely satisfactory in several respects, this closure is relatively transparent and permits replication of results by others. (2) The trade balance is fixed for all countries but one.

7. Simulation results

Trade policy changes can have significant economic and social effects. Governments tend to accord considerable importance to changes in trade flows, viewing an increase in exports as a potential benefit and an increase in imports as threatening domestic production. If domestic production is displaced by foreign imports in sensitive sectors, governments risk social unrest. In addition, many developing-country governments are concerned that trade liberalization will significantly reduce government revenues. This is a major concern where tariff revenues constitute a significant proportion of public revenue. For these governments, reductions in tariff revenues will mean that they will have to raise taxes on income, profits, capital gains, property, labour and consumption, or on non-tax revenues (such as investments, excise, fines, asset sales) to compensate. Broad-based taxes tend to be less distortionary than tariffs, but are not as simple to administer. Finally, governments are concerned about the adjustment that labour markets must undergo following trade liberalization. Changes in trade policy might entail job losses and a fall in wages.

The next section analyses the impacts of the trade policy scenarios described above on exports revenues, imports, government revenues, welfare, sectoral output changes and changes in labour use. In general, the degree of ambition in the various scenarios can be evaluated by the global change in export revenues, with the more ambitious scenarios creating a greater impact. However, this rule does not necessarily apply to all sectors in an economy or countries.

7.1 Export revenues

The implications for export revenues from the 10 scenarios described above are shown in Table 12. There are increases in export revenues for almost all regions under all the scenarios. Overall, the more ambitious tariff reduction formulae lead to greater changes in export revenues. Of the ambitious, moderate and flexible variations in each of the Swiss, WTO and linear Capped

approaches, the ambitious scenarios generate greater export revenue gains in almost all cases. Moreover, there is relatively little difference between the Swiss, WTO and Capped approaches. For example, in each "ambitious" scenario the magnitudes of the export revenue effects are somewhat similar. Global export revenue effects are 4.6 per cent, 4.3 per cent and 4.1 per cent respectively under the three "ambitious" scenarios. This observation also holds for most individual countries.

A second observation is that the increase in exports is not evenly distributed. The major beneficiaries, in percentage terms at least, are China, India, Brazil and Rest of South Asia.[14] In absolute terms, the gains in export revenue are shared roughly equally between developed and developing countries. For example, under the Swiss "ambitious" scenario – the most liberalizing of the partial scenarios –global export revenue gains are estimated at $317 billion, of which $163 billion accrues to developing countries, particularly China ($73 billion), South- East Asia ($17 billion), India ($15 billion) and the Middle East and North Africa region ($15 billion). Export gains for the EU, the United States and Japan are estimated to be $51 billion, $44 billion and $27 billion respectively (figures not shown in table).

The results for China and India are noteworthy: China's exports increase by 15 per cent under the Swiss "ambitious" scenario. The major increases are to the developed markets: the EU ($16 billion), the United States ($18 billion) and Japan ($11 billion). There are also significant increases, in percentage terms, to developing-country/regional markets: India (50 per cent), Brazil (39 per cent), Bulgaria (71 per cent), Rest of South Asia (30 per cent), South-East Asia (28 per cent), the Andean Pact[15] (31 per cent) and the Southern Cone region (Argentina, Chile and Uruguay) (36 per cent). But these exports, which amount to a total of $18 billion, account for only 24 per cent of China's export growth. By sector, the major increases in exports in value terms are in apparel ($16 billion to the EU, Japan and the United States), electronics ($13 billion to the EU and the United States), textiles ($10 billion) and machinery and equipment ($8 billion).

For India, the estimated increase in exports following implementation of the Swiss "ambitious" scenario is 26 per cent, or $16 billion. As with China, the major destinations for the additional exports from India are the EU ($6 billion) and the United States ($3 billion), while China and South-East Asia account for $1 billion each. By sector, the largest components of Indian exports are textiles ($2.2 billion), apparel ($2.4 billion), other manufactures ($2.0 billion), and machinery and equipment ($1.6 billion).

The export gains to some of the smaller countries examined in the case studies in part II of this book – Bangladesh, Malawi, Zambia and Bulgaria – are generally modest. Bangladesh and Zambia show minimal gains in industrial exports across all scenarios. Bangladesh loses some of its preferential access in the textiles and leather sectors, but gains in sales of apparel, unprocessed agricultural products and business services. In the case of Bangladesh in prticular, the distinction between textiles and apparel is somewhat misleading.

[14] The estimates for the EU, just over one per cent, appear deceptively small because the base data includes a large proportion of intra-EU trade. Tariff barriers among the 25 EU members were removed prior to simulation.

[15] The Andean Pact includes Bolivia, Colombia, Ecuador, Peru and Venezuela.

Table 12. Changes in export revenue relative to base under`` alternative scenarios

	Free trade	Swiss			WTO			Capped		
		Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible
		%	%	%	%	%	%	%	%	%
EU[16]	2.6	1.9	1.7	1.2	1.8	1.3	1.2	1.7	1.3	1.1
United States	6.9	4.9	4.8	3.5	4.9	5.1	4.5	4.8	4.8	3.5
Japan	8.9	5.9	5.3	3.7	5.8	5	4.5	5.4	4.7	3.4
Canada	2.0	1.3	1.3	1.1	1.3	1.3	1.2	1.2	1.2	0.9
Rest of OECD	6.0	3.1	2.9	2.1	2.6	2.7	2.3	2.6	2.4	1.7
High-income Asia	7.9	5.4	4.2	3.2	5.5	3.7	3.4	5.1	3.7	3
China, incl. Hong Kong	18.7	15.2	13.8	11.8	15.3	12.8	11.9	14.7	13	11.1
India	43.8	25.1	19.5	13.5	18.8	5.6	4.2	17	7.4	4.4
Brazil	20.4	11.4	8.1	4.8	9.2	3.2	3	8.6	3.4	2.7
Mexico	8.3	4.6	2.9	1.6	3.5	0.6	0.6	3.2	0.7	0.5
Bangladesh	56.1	0.8	1.3	0.8	0.7	1.5	1.4	0.7	1.5	0.8
Philippines	7.5	2.8	0.9	0.4	2.4	0.8	0.7	2.3	0.7	0.2
Malawi	24.7	6.6	5.4	4.2	6.5	3.7	3.2	6.5	3.1	2.5
Zambia	11.8	0.2	0.2	0.2	0.5	0.3	0.2	0.7	0.4	0.3
Bulgaria	14.4	6.0	3.8	2.6	5.1	1.4	1.2	4.5	1.6	1.3
Rest. of South Asia	22.4	11.5	8.8	4.9	9.1	5.9	5	7.8	6	2.9
South-East Asia	11.6	5.6	3.6	2.4	5.2	2.5	2.1	4.3	2.5	1.6
Central America and the Caribbean	20.9	9.4	6.8	3.8	8.7	4.9	4.3	8.7	4.9	2.5
Andean Pact	10.1	4.2	2.9	1.2	3.1	1.1	0.9	2.9	1.1	0.7
Argentina, Chile and Uruguay	13.7	6.7	5.3	3.8	5.5	3.2	3	5.1	3.3	2.8
Middle East and North Africa	15.1	5.8	4.5	3.1	4.4	1.6	1.4	4	1.8	1.4
Sub-Saharan Africa	17.5	3.9	2.4	1.8	3.9	1.6	1.4	3.6	1.6	1.2
All other regions	13.6	3.8	2.7	1.9	3.4	1.8	1.6	3.2	1.8	1.4
Developing countries	15.9	8.5	6.8	7.7	4.8	4.4	7.2	5.0	4.0	
World	**7.7**	**4.6**	**3.9**	**2.9**	**4.3**	**3.2**	**2.9**	**4.1**	**3.2**	**2.5**

Source: GTAP simulations

[16] Unless otherwise indicated EU refers to EU25 Member States.

Zambia also appears to gain little from liberalization. The increase in exports of processed agriculture to the EU and other manufactures to India does not outweigh the fall in exports of textiles to sub-Saharan Africa and the EU, and non-ferrous metals to the Middle East and North Africa, and South-East Asia. Sub-Saharan Africa imports more of its textiles from the EU and high-income Asia, whereas the Middle East and North Africa region sources more of its imports from the EU and from countries within its own region.

Malawi exports more textiles and apparel to other countries in sub-Saharan Africa and processed agricultural products to the EU.

Finally, Bulgaria enjoys export gains in all sectors, particularly leather, machinery and equipment, and chemicals, rubber and plastics. A reduction in apparel sales to the EU is partially offset by additional exports to the United States, other developed countries and Rest of the World. Leather sales to Japan are also sizeable.

It may be noted that South-South trade would also expand more under the more ambitious scenario This result can be observed by comparing export revenues in the WTO "ambitious" and "moderate" scenarios. In these two scenarios, the developed-country tariff reductions are similar, (Table 8), but, in the developing countries, the average tariff is reduced marginally from 11.6 to 6.3 per cent in the "ambitious" case and 10.4 per cent in the "moderate" case (Table 9). For developing countries as a group, exports increase from 4.8 to 7.7 per cent under the "ambitious" scenario, amounting to an increase of $56 billion The impact on Sub-Saharan African exports, is an increase of 1.6 per cent in the "moderate" case and 3.9 per cent in the "ambitious" case (Table 12).

A final observation concerns the erosion of preferences. The WTO "moderate" scenario indicates substantial reductions by developed countries and very few by developing countries. This implies that countries with preferential access to developed-country markets lose the advantage of preferences. Least-developed countries, in particular, are concerned that their exports may suffer as a result. However, the results indicate that the market opening effects of liberalization more than offsets the trade diversion effects. These can be seen in the WTO "moderate" column in Table 12. Export revenues increase in all developing-country regions. As noted in the previous paragraph, sub-Saharan African exports increase in all scenarios, despite the erosion of preferences.

7.2 Imports

A similar story holds for imports at the regional level: national imports move broadly in line with exports. This reflects our assumption that countries adopt policies aimed at maintaining their balance of trade. The regional changes are shown in Table 13. Once again, it is the level of ambition rather than the formula chosen that is important. However, the approaches may have varying sectoral effects, and the bilateral flows will differ from exports. For example, a quarter of China's additional exports go to the United States following the Swiss "ambitious" scenario, but only 16 per cent of additional imports are sourced from the United States. To supply inputs into its expanding apparel sectors, $11 billion in additional textiles are sourced from Japan and high-income Asia.

Table 13. Changes in imports relative to base under alternative scenarios

	Free trade	Swiss			WTO			Capped		
		Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible
		%	%	%	%	%	%	%	%	%
EU	2.6	1.9	1.7	1.3	1.8	1.4	1.3	1.7	1.3	1.1
United States	4.9	3.5	3.4	2.5	3.5	3.6	3.2	3.4	3.4	2.5
Japan	10.3	6.9	6.1	4.3	6.7	5.8	5.2	6.2	5.4	3.9
Canada	2.2	1.5	1.5	1.2	1.4	1.4	1.3	1.4	1.4	1
Rest of OECD	6.8	3.5	3.4	2.4	3	3.1	2.7	3	2.7	1.9
High-income Asia	8.7	6	4.6	3.6	6.1	4.1	3.7	5.7	4.1	3.4
China, incl. Hong Kong	23.3	19	17.3	14.8	19.1	16	14.9	18.4	16.2	13.8
India	47	27	20.9	14.5	20.2	6	4.5	18.2	7.9	4.7
Brazil	18.5	10.4	7.4	4.4	8.3	2.9	2.7	7.8	3.1	2.5
Mexico	9.2	5.2	3.2	1.7	3.9	0.7	0.7	3.6	0.7	0.6
Bangladesh	44	0.6	1	0.6	0.6	1.2	1.1	0.6	1.1	0.6
Philippines	6.7	2.5	0.8	0.3	2.2	0.7	0.6	2	0.6	0.2
Malawi	25.6	6.8	5.6	4.4	6.8	3.8	3.3	6.8	3.3	2.6
Zambia	13	0.3	0.2	0.3	0.5	0.3	0.2	0.8	0.4	0.3
Bulgaria	13.6	5.7	3.6	2.4	4.8	1.3	1.2	4.3	1.5	1.2
Rest of South Asia	22.1	11.4	8.7	4.9	9	5.9	5	7.7	6	2.9
South-East Asia	15.8	7.6	4.9	3.2	7	3.4	2.9	5.8	3.3	2.2
Central America and the Caribbean	13.9	6.3	4.5	2.5	5.8	3.2	2.9	5.8	3.2	1.7
Andean Pact	10.2	4.3	2.9	1.2	3.1	1.1	0.9	2.9	1.2	0.7
Argentina, Chile and Uruguay	14.9	7.3	5.7	4.2	6	3.4	3.2	5.6	3.6	3.1
Middle East and North Africa	14.8	5.7	4.5	3	4.4	1.6	1.4	3.9	1.8	1.4
Sub-Saharan Africa	17.4	3.9	2.4	1.8	3.9	1.6	1.3	3.6	1.5	1.1
All other regions	14.2	4	2.8	1.9	3.6	1.9	1.7	3.4	1.9	1.4
Developing countries	17.5	9.4	7.5	5.6	8.5	5.3	4.8	7.9	5.4	4.3
World	**7.7**	**4.6**	**3.9**	**2.9**	**4.3**	**3.2**	**2.9**	**4.1**	**3.2**	2.5

Source : GTAP simulations.

7.3 Government revenues

The most ambitious (Swiss) scenario modelled here results in a global reduction in tariff revenues of 50 per cent (see Table 14). In each case, the harmonizing Swiss formula leads to greater losses in revenue than the alternative WTO or linear Capped approaches. This applies at the three levels of ambition, and the pattern tends to hold across all regions.

Table 14. Initial and change in tariff revenue under alternative scenarios

		Swiss			WTO			Capped		
		Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible
	$b	%	%	%	%	%	%	%	%	%
EU	27.1	-58	-58	-33	-56	-61	-50	-53	-53	-32
United States	20.0	-79	-79	-49	-79	-83	-72	-78	-77	-46
Japan	17.1	-45	-46	-30	-46	-48	-42	-44	-44	-24
Canada	3.0	-58	-58	-39	-55	-60	-52	-53	-53	-34
Rest of OECD	8.0	-47	-47	-28	-34	-41	-30	-33	-33	-13
High-income Asia	17.7	-55	-37	-30	-58	-31	-29	-53	-33	-30
China, incl. Hong Kong	32.5	-79	-70	-65	-81	-64	-61	-77	-67	-62
India	12.9	-61	-44	-30	-44	-7	-5	-40	-11	-8
Brazil	5.6	-56	-31	-13	-43	0	1	-39	-2	0
Mexico	6.8	-50	-26	-11	-39	-8	-7	-37	-8	-7
Bangladesh	1.7	1	1	1	1	2	2	1	2	1
Philippines	1.2	-32	-2	-1	-27	1	1	-23	1	-1
Malawi	0.1	5	5	3	5	3	2	5	2	2
Zambia	0.1	0	0	0	1	0	0	1	0	0
Bulgaria	0.5	-41	-22	-12	-34	-5	-4	-28	-6	-4
Rest of South Asia	2.5	-38	-20	-9	-18	3	2	-8	2	0
South-East Asia	14.0	-37	-14	-9	-33	-2	-2	-21	-4	-4
Central America and the Caribbean	3.6	-23	-8	-1	-19	3	3	-19	2	1
Andean Pact	4.8	-42	-26	-10	-29	-1	-1	-25	-2	-1
Argentina, Chile and Uruguay	3.3	-40	-19	-6	-29	0	1	-26	0	1
Middle East and North Africa	22.0	-32	-24	-16	-24	-5	-4	-20	-7	-5
Sub-Saharan Africa	10.6	-16	-8	-5	-16	-3	-2	-13	-2	-2
All other regions	15.2	-19	-10	-6	-17	-3	-3	-15	-4	-3
Developing countries	142.7	-44	-30	-23	-38	-15	-14	-34	-17	-15
World	**230.2**	**-50**	**-40**	**-27**	**-45**	**-30**	**-27**	**-42**	**-30**	**-21**

Source: GTAP database and simulations.

However, all the scenarios indicate a significant variation between regions: from a five per cent gain in Malawi to an 83-per-cent fall in the United States. These variations reflect where the tariff cuts fall, the relationship between bound and applied rates, and the relevant import elasticity. For example, cuts in bound rates may have no impact on applied rates if the initial difference exceeds the cut. Imports of luxury goods with a high elasticity may increase sufficiently to offset the tariff reduction, leading to an increase in revenue. The harmonizing Swiss and WTO formulae tend to reduce tariff revenues by the greatest amount in high tariff regions, but the gap between bound and applied rates also matters. For example, the linear approach leads to similar tariff losses for low-tariff China as the harmonizing approaches, but for other developing countries, the tariff revenue losses tend to be lower under the linear Capped formula. In particular, there is a large difference between the Swiss "moderate" and the other "moderate" approaches. Developing countries lose 30 per cent of their revenue in the first case yet only 15 and 17 per cent respectively in the WTO and Capped approach. This is most apparent in the double digit declines for developing countries under the Swiss "moderate" scenario

Clearly, large falls are more significant in developing countries that are more dependent on tariffs as a source of revenue. The lowest income developing countries tend to be the most dependent on tariffs as a source of revenue (see Table A5).

7.4 Welfare

Static annual welfare effects of the various scenarios, plus free trade, are shown in Table 15. The welfare effects tend to be associated with trade flows: an increase in trade generates increased welfare. At a global level the Swiss "ambitious" scenario generates the greatest potential gains, of almost $135 billion. This compares with a free trade result of over $200 billion. As with trade flows, the three Swiss scenarios generate greater welfare effects than the equivalent WTO and Capped approaches.

However, the welfare benefits of greater ambition are relatively modest. Reducing trade-weighted applied industrial tariffs from the initial average of 3 to 0.8 per cent (rather than 1.5 per cent) in developed countries and from 8 to 3.8 (rather than 6.2 per cent) (see Tables 14 and 15) generates 25 to 30 per cent more in global-welfare gains. In other words, the initial reductions generate the greatest gains. This is the rationale behind reducing individual tariff peaks.

At a regional level, the distribution of the gains is fairly constant across the scenarios, with 58–67 per cent of the welfare gains going to the developing countries, reflecting the existing trade flows and protection patterns. The share of gains to developing countries tends to rise under the "ambitious" scenarios in which the applied tariffs of developing countries are reduced compared with their being somewhat sheltered under the flexible formula. For example, in the Capped approach, developing country gains are $54, $66 and $78 billion under the ambitious, moderate and flexible scenarios respectively, but the average tariffs are reduced from 8 per cent to 6.2, 5.9 and 3.8 per cent respectively (Table 9b). The moderate scenario seems to generate reasonable gains with modest tariff reductions. This is because under the moderate Capped formula, developed countries' additional tariff cuts are quite significant, with the average industrial tariff being reduced from 1.5 per cent under the flexible formula to 0.8 per cent (Table 8b).

Table 15. Changes in welfare relative to base under alternative scenarios

	Free trade	Swiss			WTO			Capped		
		Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible	Ambitious	Moderate	Flexible
	$ b	$ b	$ b	$ b	$ b	$ b	$ b	$ b	$ b	$ b
EU	28.5	22.6	20.1	20.4	21.3	15.8	16.7	20.7	16.8	18.4
United States	11.2	5.8	5.2	7.0	5.9	4.9	5.4	5.9	5.3	7.2
Japan	11.5	9.1	7.7	6.4	8.6	6.9	6.5	7.9	6.5	6.1
Canada	0.5	0.8	0.7	1.0	0.8	0.6	0.8	0.9	0.8	1.0
Rest of OECD	4.9	3.1	3.0	2.8	3.2	3.0	3.0	3.2	3.0	2.7
High-income Asia	8.9	6.5	6.2	4.9	6.1	5.7	5.3	5.8	5.4	4.3
China, incl. Hong Kong	46.1	41.2	40.0	34.8	40.9	38.8	36.7	40.3	38.6	32.7
India	11.7	5.1	4.8	3.5	4.2	2.7	2.1	3.8	3.1	1.8
Brazil	5.4	2.7	2.3	1.6	2.1	1.2	1.1	1.9	1.3	1.0
Mexico	2.8	2.1	1.6	1.1	1.4	-0.2	-0.1	1.2	-0.1	0.2
Bangladesh	1.3	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1
Philippines	0.6	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.2
Malawi	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
Zambia	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bulgaria	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1
Rest of South Asia	2.6	1.5	1.4	0.8	1.3	1.1	0.9	1.1	1.1	0.5
South-East Asia	17.4	10.4	8.6	6.7	10.0	7.6	7.0	9.0	7.6	5.4
Central America and the Caribbean	3.0	1.8	1.7	1.2	1.7	1.4	1.3	1.7	1.4	0.9
Andean Pact	1.1	0.7	0.6	0.4	0.6	0.4	0.4	0.6	0.5	0.3
Argentina, Chile and Uruguay	5.7	3.5	3.2	2.7	3.1	2.5	2.4	3.0	2.5	2.3
Middle East and North Africa	14.1	8.4	7.1	5.9	7.4	3.6	3.2	7.1	4.1	3.4
Sub- Saharan Africa	8.2	2.9	2.2	2.0	2.9	1.7	1.6	2.8	1.7	1.6
All other regions	14.7	5.9	5.0	4.2	5.6	4.2	3.9	5.4	4.2	3.6
Developing countries	135.3	86.9	79.1	65.2	81.7	65.7	61.1	78.4	66.4	54
World	**200.8**	**134.7**	**122.2**	**107.6**	**127.6**	**102.7**	**98.7**	**122.8**	**104.1**	**93.7**

Source: GTAP simulations.

7.5 Labour use

In these simulations it is assumed that employment of unskilled labour in developing countries would rise as demand for such labour in labour-intensive industries increases. Conversely, employment could fall if, relatively, prices moved unfavourably. Results are shown in Table 16 for the three WTO scenarios and for free trade.[17] In developed countries, with more rigid unskilled labour markets, the real wage, rather than the quantity of labour, is assumed to be flexible. The contribution to welfare gains in developing countries based on the assumption of a flexible unskilled labour force can be seen in Table 17, in which welfare under the WTO "moderate" scenario is compared under alternative assumptions. Global welfare gains are almost $103 billion with a flexible labour force compared with $63 billion with flexible wages. Most of the gain accrues to China. These results illustrate the importance of utilizing all available resources.

Table 16. Changes in unskilled labour use in developing countries relative to base

			WTO	
	Free trade	Ambitious	Moderate	Flexible
	%	%	%	%
China, incl. Hong Kong	7.0	6.0	5.4	5.2
India	5.7	1.7	0.7	0.6
Brazil	1.9	0.4	-0.3	-0.3
Mexico	1.8	0.8	0.1	0.1
Bangladesh	7.9	0.0	0.1	0.1
Philippines	3.1	1.4	0.8	0.7
Malawi	11.0	2.6	1.5	1.3
Zambia	6.3	0.3	0.1	0.1
Bulgaria	3.5	1.1	0.3	0.3
Rest of South Asia	4.9	1.4	1.1	1.0
South East-Asia	7.1	3.4	1.9	1.7
Central America and the Caribbean	7.4	2.8	1.5	1.4
Andean Pact	1.6	0.6	0.2	0.2
Argentina, Chile and Uruguay	1.7	0.3	-0.1	-0.1
Middle East and North Africa	5.3	1.9	0.7	0.6
Sub-Saharan Africa	6.6	1.5	0.7	0.6
All other regions	4.7	1.3	0.7	0.7

Source : GTAP simulations.

[17] Employment seems to vary with the level of ambition, but less so with the degree of harmonization.

Table 17. Changes in welfare with flexible labour and wages under the WTO "moderate" scenario

	Welfare change with flexible labour	Welfare change with flexible wages
	$b	$b
EU	15.8	15.5
Developing countries	65.7	27.3
United States	4.9	4.5
Japan	6.9	6.7
Canada	0.6	0.6
Rest of OECD	3.0	2.9
High-income Asia	5.7	5.5
China, incl. Hong Kong	38.8	10.0
India	2.7	1.5
Brazil	1.2	1.7
Mexico	-0.2	-0.3
Bangladesh	0.1	0.0
Philippines	0.4	0.3
Malawi	0.0	0.0
Zambia	0.0	0.0
Bulgaria	0.0	0.0
Rest of South Asia	1.1	0.7
South-East Asia	7.6	5.0
Central America and the Caribbean	1.4	0.9
Andean Pact	0.4	0.2
Argentina, Chile and Uruguay	2.5	2.5
Middle East and North Africa	3.6	1.7
Sub-Saharan Africa	1.7	0.8
All other regions	4.2	2.1
World	**102.7**	**62.9**

Unskilled labour use in developing countries responds positively to liberalization in every instance. The changes are positive but quite small, and somewhat variable. With the flexible scenario, most of the changes are less than 1 per cent, but under the hypothetical free trade scenario the increases are as high as 11 per cent in Malawi (Table 16). The variations depend on the demand for the products that can be produced with unskilled labour. Most unskilled labour is used in the services sectors. Outside of services and agriculture, a significant amount of unskilled labour is used in lumber, leather, paper products, apparel, light manufactures and electronics.

Rising employment at a national level does not imply similar sectoral effects. Some sectors are bound to employ less labour (and capital and intermediate inputs). Unemployment in particular sectors is seen as a major adjustment problem, and a serious impediment to reform. To illustrate the potential effects, Table 18 shows the use of labour in selected sensitive sectors for the WTO "moderate" scenario.

Table 18. Use of labour in selected sectors, WTO moderate scenario

	Textiles	Wearing apparel	Leather	Motor Vehicles
	%	%	%	%
EU	-5.8	-7.1	-4.4	-0.6
United States	-8.1	-8.9	-16.1	0.1
Japan	6	-7.2	-30.4	3
Canada	-16.4	-17.5	-20.8	0.3
Rest of OECD	-9.2	-9.8	-4.2	-1.6
High –income Asia	13	14.8	12.5	2
China, incl. Hong Kong	17.4	25.2	21.1	-1.9
India	5.5	22.3	-2.3	0.7
Brazil	-0.7	-0.1	-7.8	-2.2
Mexico	-8	-13.5	-4.5	1.3
Bangladesh	0.2	6.2	-16.1	-0.4
Philippines	20.8	35.6	-5	0
Malawi	12.1	27.9	-7.6	-4.5
Zambia	-4.2	-0.5	-6.3	4.2
Bulgaria	-2.3	-5.6	1.8	0.5
Rest of South Asia	5.1	25.3	-9	-0.7
South East-Asia	11.6	18.4	22.4	2.5
Central America and the Caribbean	25.9	12.2	-3.4	0.3
Andean Pact	3.5	4.2	-1	-2.1
Argentina, Chile and Uruguay	-7.6	-4.2	-10.2	2.5
Middle East and North Africa	-2.6	-1.1	-2.7	1.3
Sub-Saharan Africa	0.6	2.6	-6.7	4.2
All other regions	0.8	1.1	-1.3	0.9

Source : GTAP simulations.

The results indicate some substantial changes, positive and negative, in specific sectors. The negative effects are of the most interest. For example, in the leather sector, there is a loss of skilled and unskilled employment of over 30 per cent in Japan and nearly 21 per cent in Canada. In developing countries, the losses tend to be less than 10 per cent, one exception being leather in Bangladesh. These data give an indication of the structural adjustment that would be needed. However, the size of the sector should also be taken into account (e.g. leather is not a big employer in Japan), and the ability of workers to find jobs in other sectors requiring similar skills.

7.6. Output

Changes in output for the WTO "moderate" scenario are shown in the appendix (Table A30). Such changes tend to move in the same direction as labour use. For the non-sensitive sectors (i.e. those not included in Table 16), the output changes are modest for the WTO "moderate" scenario, generally less than 5 per cent downwards. However, under the free trade scenario (not shown here) some of the output changes can be quite large, perhaps 50 per cent in some specific sectors. The importance of each sector to the economy or region can be gauged by examining the initial output values.

7.7. Sectoral tariff elimination

The large number of variables to be negotiated makes it difficult to identify what is driving the tariff reductions, that is, to determine what countries will have to do and what benefits they will receive. Calculations undertaken at the tariff line level indicate that removing the sectoral elimination

of tariffs for developing countries makes a significant difference to their average tariffs, trade and welfare. This is essentially the difference between the various "ambitious" and "moderate" scenarios. Removing the sectoral elimination of tariffs for developed countries as well ("flexible" scenario) makes the proposals much less ambitious. To quantify this, we simulated the removal of tariffs in specific sectors (electronics and electrical goods; fish and fish products; footwear; leather goods; motor vehicle parts and components; stones, gems and precious metals; and textiles and clothing) while leaving other industrial tariffs unchanged. The agriculture and service sectors were treated as in most of the other simulations. The results are shown in Table 19, along with the WTO "moderate" scenario for comparison. The elimination of all tariffs in specific sectors alone generates similar revenue and welfare gains as the WTO "moderate" scenario. The share of developing-country welfare gains for the two scenarios is around 64 per cent. However, individual country or regional shares differ. Comparing the two scenarios, the greatest beneficiary of sectoral elimination among the developed countries/groupings is the EU. Among developing countries/regions, the Middle East and North Africa, South-East Asia, Mexico and India would benefit most from a sectoral elimination approach, but all developing countries would enjoy greater exports at the expense of the United States, Japan, Canada and Rest of OECD. By sector, there are lower impacts on textiles, metals and other manufactures, which are exempt from proposed tariff elimination, and greater impacts on motor vehicles and chemicals, rubber and plastics.

Table 19. Impacts of sectoral tariff elimination on revenues and welfare compared with WTO moderate scenario

	WTO moderate		Sectoral tariff elimination	
	Export revenue	Welfare	Export revenue	Welfare
	%	$million	%	$million
EU	1.3	15 805	1.5	20 736
Developing countries	4.8	4 191	2.9	5 100
United States	5.1	4 899	3.9	5 897
Japan	5	6 920	4.5	6 230
Canada	1.3	635	1.2	1 312
Rest of OECD	2.7	3 031	2.3	3 001
High-income Asia	3.7	5 743	4.5	5 048
China, incl. Hong Kong	12.8	38 827	13.5	38 842
India	5.6	2 703	15.1	3 465
Brazil	3.2	1 190	8.0	1 641
Mexico	0.6	-172	3.3	1 379
Bangladesh	1.5	64	0.7	34
Philippines	0.8	412	2.2	412
Malawi	3.7	31	6.5	50
Zambia	0.3	2	0.9	15
Bulgaria	1.4	49	4.2	55
Rest of South Asia	5.9	1 104	7.8	1 095
South-East Asia	2.5	7 636	4.0	8 706
Central America and the Caribbean	4.9	1 425	8.6	1 711
Andean Pact	1.1	424	2.9	610
Argentina, Chile and Uruguay	3.2	2 455	4.7	2 811
Middle East and North Africa	1.6	3 646	3.5	6 742
Sub-Saharan Africa	1.6	1 694	3.6	2 897
All other regions	1.8	4 191	2.9	5 100
Total	**3.2**	**102 714**	**3.6**	**117 789**

Source: GTAP simulations.

8. Implications and conclusions

Negotiators seeking to bring the current round of NAMA negotiations to a close face several challenges: the choice of a formula, the degree of sectoral elimination, the treatment of unbound tariffs, the degree of special and differential treatment for developing countries, and the method of calculating the binding level of currently unbound tariffs.

Reducing tariffs on a non-linear rather than a capping basis would appear to contribute little to the outcome. Non-linear cuts have a harmonizing effect within countries, and while there are more benefits from reducing high tariffs than low ones, the bulk of the impact can be obtained from a more transparent Capped formula. The linear Capped formula provides similar effects to the more complex harmonizing formulae. For example, the WTO and Capped "ambitious" scenarios provide similar tariff cuts for developed countries, but the welfare gains are proportional to these cuts.

A further issue is exclusions, both in terms of what should be bound and whether newly bound tariffs should be cut. Allowing countries to bind at twice the simple average of bound tariffs for developing countries provides greater flexibility for sensitive products, and introduces a degree of harmonization across countries. We did not estimate the separate effect of this provision in the simulation exercises. However, experience from previous rounds indicates that exclusion of certain products (e.g. textiles) can lead to significant distortions and disillusionment with the final outcome, leading to greater problems later.

Eliminating tariffs in specific sectors appears to have similar effects as the less transparent and broader based approaches. Global and regional export revenue and welfare impacts are somewhere between the Swiss and WTO "moderate" approaches. Because of the linkages between sectors, with output in one sector used as an input into another, the output effects from eliminating tariffs in specific sectors are distributed across all sectors. Although dismissed as inadequate in earlier negotiations, this approach is transparent and provides similar gains to more obscure scenarios.

Where to go from here? There is an obvious trade-off between ambition and flexibility, with each of the Members wanting to retain flexibility for themselves without weakening the whole agreement. The simulations indicate that similar outcomes can be obtained from a variety of approaches. The various exclusions and exemptions are as important as the formula itself. Future research could usefully separate out the effects of the various individual exclusions that are not captured in the formula.

Adjustment costs appear to be a major stumbling block to progress in the negotiations. Once a formula is agreed and implemented, attention will turn to mitigating the adjustment costs. A phased-in adjustment, e.g. over 10 years, should help. Nonetheless, some sectors will experience significant output and employment losses. The simulations presented here help to identify where the losses are likely to occur. Difficulties arise where workers made redundant have skills that cannot be readily transferred to another industry, or if the industry is in a specific location. Appropriate policies need to be in place to help the labour force adjust in these circumstances.

A further stumbling block in the negotiations is the erosion of preferences. However, simulated results indicate that the trade expansion effects of market opening exceed the trade diversion effects of loss of preferential access for the developing-country groups modelled here. It should be noted, however, that these results may not hold for individual countries.

Modelling results need to be interpreted with caution, and policy-makers should certainly keep in mind social, political, environmental and other factors of importance. It is also useful to compare the results from different models and to understand what drives any differences. Overall, the results indicate there are gains to be had from further liberalization, and developing countries can obtain a significant share of the benefits, provided policies are put in place to assist the adjustment process.

References

Brown D, Deardorff A and Stern R (2001). CGE modeling and analysis of multilateral and regional negotiating options. University of Michigan School of Public Policy Research Seminar in International Economics, Discussion Paper No. 468.

Caballero R and Engel E (2003). Adjustment is much slower than you think. Massachusetts Institute of Technology, Dept. of Economics, Working Paper No. 03-25, Cambridge, MA. Yale Economic Growth Center, Discussion Paper No. 865, and Cowles Foundation Discussion Paper No. 1430.

Davidson C and Matusz S (2001). On Adjustment Costs. Michigan State University, MI.

Ebrill L, Stotsky J and Gropp R (1999) Revenue Implications of Trade Liberalisation. IMF Occasional Paper 180. Washington, DC, International Monetary Fund.

Deardoff A, Stern R (1997). Measurement of Non-Tariff Barriers. Economics Department Working Paper No. 179. Paris, OECD.

GTAP http://www.gtap.agecon.purdue.edu/.

Fernandez de Cordoba S, Laird S and Vanzetti D (2004). Trick or treat? Development opportunities and challenges in the WTO negotiations on industrial tariffs. Credit Research Paper, University of Notthingham.

Fernandez de Cordoba S, Laird S and Vanzetti D (2004). Blended like Beckman: Trying to read the ball in the World Trade Organization negotiations on industrial tariffs. Journal of World Trade, 38(5).

Fernandez de Cordoba S, Laird S and Vanzetti D (2005?). Smoke and mirrors: Making sense of the WTO industrial tariff negotiations. Trade Policy Issues. Geneva, UNCTAD (forthcoming).

Finger M, Schuknecht L (1999). Market access advances and retreats: The Uruguay Round and beyond. World Bank Working Paper 2232. Washington, DC, World Bank.

Francois J (2000). Assessing the results of general equilibrium studies of multilateral trade negotiations. Policy Issues in International Trade and Commodities Study Series No. 3. Geneva, UNCTAD.

Francois J, Van Mejil H and Van Tongeren F (2003). Economic Implications of Trade Liberalization Under the Doha Round. CEPII Please spell out and indicate what kind of publication this is and where it is published from

Kurzweil M (2002). The need for a “Complete” labor market in CGE modeling. Available at: www.gtap.org.

Laird S (1998). Multilateral approaches to market access negotiations. WTO-TPRD Staff Working Paper TPRD-98-02. Geneva, WTO

Laird S, Cernat L and Turrini A (2003). The Doha Agenda: Back to Basics. Geneva, UNCTAD.

Laird S, Fernandez de Córdoba S and Vanzetti D (2003). Market access proposals for non-agricultural products. In: Mbirimi I, Chilala B and Grynberg R, eds., From Doha to Cancún: Delivering a Development Round. Commonwealth Secretariat, Economic Paper 57, London.

Martin W (2001). Trade Policies, Developing Countries, and Globalization. Washington, DC, World Bank.

McDougall, Initials, and year? Uses and abuses of AGE models. GTAP Working Paper. No? and institution and place of publication?

Mehta P and Agarwal initial? (2004). Non-agriculture market access negotiations: post-Cancun issues and implications for industrial tariffs. Economic and Political Weekly July 24.

Panagariya A (2002). Formula approaches to reciprocal tariff liberalisation. In: Hoekman B, Mattoo A and English P, eds., Development, Trade and the WTO. Washington, DC, World Bank.

Rodrik D (1999). The new global economy and developing countries: Making openness work. Policy Essay 24. Washington, DC, Overseas Development Council.

Rodrik D (2001). The global governance of trade: As if development really mattered. Cambridge MA, Harvard University, Kennedy School of Government. Paper prepared for UNDP.

Stern RM (1976). Evaluating alternative formulas for reducing industrial tariffs. Journal of World Trade Law, 10: 50-64.

Turrini A(2002). International trade and labour market performance: Major findings and open questions. Issues in International Trade and Commodities Study Series No.20 (UNCTAD/ITCD/TAB/21). Geneva, UNCTAD.

UNCTAD (2004). Review of developments and issues in the Post-Doha Work Programme of Particular Concern to Developing Countries: A post-UNCTAD XI perspective. TD/B/51/ is this doc no. incomplete? Geneva.

World Bank (2003). World Development Indicators, 2003. Available on CD-ROM, Washington, DC.

WTO (2002). WTO Members' Tariff Profiles" – Note by the Secretariat – Revision, TN/MA/S/4/Rev.1. Geneva.

WTO (2002). Market Access for Non-Agricultural Products – Communication from the European Communities, TN/MA/W/1. Geneva.

WTO (2002). Market Access for Non-Agricultural Products – Communication from India, TN/MA/W/10 and TN/MA/W/10/Add.1-Add.3 (2003). Geneva.

WTO (2002). Market Access for Non-Agricultural Products – Communication from the European Communities, TN/MA/W/11, TN/MA/W/11/Add.1/Corr.1 (2002) and TN/MA/W/11/Add.1-Add.2 (2003). Geneva.

WTO (2002). Market Access for Non-Agricultural Products – Revenue Implications of Trade Liberalisation – Communication from the United States, TN/MA/W/18, TN/MA/W/18/Add.1 (2003) and TN/MA/W/18/Add.2 (2003). Geneva.

WTO (2002). Market Access for Non-Agricultural Products – Proposal of the People's Republic of China, TN/MA/W/20 and TN/MA/W/20/Corr.1 (2003). Geneva.

WTO (2003). Formula Approaches to Tariff Negotiations – Note by the Secretariat – Revision, TN/MA/S/3/Rev.2. Geneva.

WTO (2003). Contribution by Canada, European Communities and United States, JOB(03)/163. Geneva.

WTO (2003). Draft Elements of Modalities for Negotiations on Non-Agricultural Products TN/MA/35 and TN/MA/35/rev.1. Geneva.

WTO (2003). Preparations for the Fifth Session of the Ministerial Conference Draft Cancún Ministerial Text, Note by the Secretariat – Revision, JOB(03)/150, JOB(03)/150/Rev.1 and JOB(03)/150/Rev.2. Geneva.

WTO (2003). Draft Cancun Ministerial Text JOB(03)/150/Rev.2. Geneva.

WTO (2003). Draft Ministerial Statement WT/MIN(03)/W/24. Geneva.

WTO (2004). Doha Work Program: July Package WT/L/579. Geneva.

Appendix 1

Table A1. Weighted and simple averages of applied and bound tariff rates on industrial products

Level of development	Applied tariff rates		Bound tariff rates	
	Weighted	Simple	Weighted	Simple
Developed countries	3	5.5	3.4	12.3
Developing countries	8	11.6	12.5	29.4
Least-developed countries	13.5	12.6	12.4	45.2

Source: WITS, UNCTAD TRAINS database and WTO CTS database

Table A2. Weighted averages of applied and bound tariff rates for industrial and all products

	Developed countries				Developing countries				Least-developed countries		
	All products		Industrial products		All products		Industrial products		All products		Industrial products
	Weighted tariff	Standard deviation	Weighted tariff	Standard deviation	Weighted tariff	Standard deviation	Weighted tariff	Standard deviation	Weighted tariff	Standard deviation	Weighted tariff
Applied rates	3.7	2.8	3	3	8.7	5.7	8	5.6	13.5	4.2	13.5
Bound rates	4.4	10.5	3.4	11.9	14.4	21.9	12.5	20.9	25.9	24.4	12.4

Source: WITS, UNCTAD TRAINS database and WTO CTS database.

Table A3. Possible scenarios

Scenario	Description	Formula	Binding	Sectoral elimination	Elimination of low nuisance tariffs	Coefficients
Free trade	Zero tariffs on all non-agricultural goods		100%			
Swiss formula	Ambitious	$T_1 = \frac{(a \times T_0)}{(a + T_0)}$	100% for all countries **Developed** = twice the applied rate **Developing** = twice the applied rate **"Paragraph 6**" = simple average of bound tariffs for all developing countries (29.4%)	Yes	All tariffs below 2% reduced to zero	Based on average weighted industrial bound tariff by country grouping Developed = 3.4% Developing = 12.5%
	Moderate	$T_1 = \frac{(a \times T_0)}{(a + T_0)}$	**Developed** = 100% **Developing and "Paragraph 6"** countries = 95% **Developed** = twice the applied rate **Developing** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) **"Paragraph 6"** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	Developed: yes Developing: no	Developed countries only: All tariffs below 2% reduced to zero	Based on average weighted industrial tariff by country grouping Developed = 3.4% Developing = 12.5%
	Flexible	$T_1 = \frac{(a \times T_0)}{(a + T_0)}$	**Developed** = 100% **Developing** and **"Paragraph 6"** countries = 90% **Developed** = twice the applied rate **Developing** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) **"Paragraph 6"** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	No	None	Twice the average weighted industrial tariff by country grouping Developed = 3.4% x 2 Developing = 12.5% x 2
WTO formula	Ambitious	$T_1 = \frac{(B \times ta \times T_0)}{(B \times ta + T_0)}$	100% for all countries **Developed** = twice the applied rate **Developing** = twice the applied rate **"Paragraph 6"** = simple average of bound tariffs for all developing countries (29.4%)	Yes	All tariffs below 2% reduced to zero	B = 1

/…

Scenario	Description	Formula	Binding	Sectoral elimination	Elimination of low nuisance tariffs	Coefficients
	Moderate	$T_1 = \frac{(B \times ta \times T_0)}{(B \times ta + T_0)}$	Developed = 100% Developing and "Paragraph 6" countries = 95% Developed = twice the applied rate Developing = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) "Paragraph 6" = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	Developed: yes Developing: no	Developed countries only: All tariffs below 2% reduced to zero	Developed, B = 0.5 Developing, B = 3
	Flexible	$T_1 = \frac{(B \times ta \times T_0)}{(B \times ta + T_0)}$	**Developed** = 100% **Developing** and **"Paragraph 6"** countries = 90% **Developing** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) **"Paragraph 6"** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	No	None	Developed B = 0.5 Developing B = 5
Capped formula	Ambitious	$T_1 = (a \times T_0)$ With a cap on any tariff more than three times the average national applied rate	100% for all countries **Developed** = twice the applied rate **Developing** = twice the applied rate **"Paragraph 6"** = simple average of bound tariffs for all developing countries (29.4%)	Yes	All tariffs below 2% reduced to zero	Developed (a) = 0.5 Developing (a) = 0.666
	Moderate	$T_1 = (a \times T_0)$ With a cap on any tariff more than three times the average national applied rate	**Developed** = 100% **Developing** and "**Paragraph 6"** countries = 95% **Developed** = twice the applied rate **Developing** = The greater of twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) **"Paragraph 6"** = The greater of twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	Developed: yes Developing: no	Developed countries only: All tariffs below 2% reduced to zero	Developed (a) = 0.5 Developing (a) = 0.666
	Flexible	$T_1 = (a \times T_0)$ With a cap on any tariff more than three times the average national applied rate	Developed = 100% Developing and "Paragraph 6" countries = 90% **Developing** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%) **"Paragraph 6"** = twice the applied rate or twice the simple average of bound tariffs for developing countries (29.4% x 2 = 58.8%)	No	None	Developed (a) = 0.5 Developing (a) = 0.8

Note: Least-developed countries are exempt from formula reductions and sectoral eliminations

Table A4. Initial binding coverage per country/region

Country	%	Country	%	Country	%	Country	%
Albania	100.00	Czech Republic	100.00	Madagascar	18.94	Romania	99.98
Antigua and Barbuda	97.59	Dominica	94.03	Malawi	19.93	Rwanda	100.00
Argentina	100.00	Dominican Republic	100.00	Malaysia	81.20	Saint Kitts and Nevis	97.59
Armenia	100.00	Ecuador	99.82	Maldives	96.69	Saint Lucia	99.50
Australia	96.51	Egypt	98.85	Mali	31.58	Saint Vincent & the Grenadines	99.41
Bahrain	71.01	El Salvador	100.00	Malta	96.75	Senegal	100.00
Bangladesh	2.89	European Union	100.00	Mauritania	30.07	Singapore	64.50
Barbados	97.59	Gabon	100.00	Mauritius	5.19	Slovenia	100.00
Belize	97.70	Georgia	99.98	Mexico	100.00	South Africa	96.01
Benin	30.09	Ghana	1.24	Moldova	100.00	Sri Lanka	27.71
Bolivia	100.00	Guatemala	24.59	Morocco	100.00	Switzerland	99.73
Brazil	100.00	Guinea-Bissau	97.39	Mozambique	100.00	Taiwan	100.00
Brunei	94.97	Guyana	100.00	Myanmar	4.69	Tanzania	0.16
Bulgaria	100.00	Honduras	100.00	Nepal	99.44	Thailand	70.85
Burkina Faso	29.91	Hong Kong	38.31	New Zealand	99.93	Togo	0.81
Cameroon	0.09	Hungary	95.83	Nicaragua	100.00	Trinidad and Tobago	100.00
Canada	99.66	Iceland	94.21	Niger	96.26	Tunisia	51.10
Central African Republic	56.81	India	69.82	Nigeria	6.94	Turkey	41.79
Chad	0.27	Indonesia	96.06	Norway	100.00	Uganda	2.86
Chile	100.00	Jamaica	100.00	Oman	100.00	United States	99.98
China	100.00	Japan	99.57	Pakistan	36.97	Uruguay	100.00
Colombia	100.00	Jordan	99.98	Panama	100.00	Venezuela	100.00
Congo, Republic of the	3.13	Kenya	1.60	Papua New Guinea	99.98	Zambia	4.01
Costa Rica	100.00	Korea, South	93.64	Paraguay	100.00	Zimbabwe	8.77
Côte d'Ivoire	22.90	Latvia	99.98	Peru	100.00		
Croatia	100.00	Lithuania	100.00	Philippines	61.79		
Cuba	20.36	Macedonia	0.00	Poland	95.81		

Source: WTO

Table A5. Contribution of tariff revenue to tax revenue

Country	%	Country	%	Country	%	Country	%
Albania	15.5	Ecuador	11.3	Lithuania	1.1	Sierra Leone	48.6
Algeria	10.9	Egypt, Arab Rep.	12.6	Luxembourg	0	Singapore	1.6
Argentina	4.3	El Salvador	6.2	Macao, China	0	Slovak Republic	1.2
Australia	2.6	Estonia	0.1	Madagascar	51.9	Slovenia	1.7
Austria	0	Ethiopia	26	Malawi	16.3	Solomon Islands	57.1
Azerbaijan	8.5	Fiji	21.5	Malaysia	12.7	Somalia	52.5
Bahamas, The	55.9	Finland	0	Maldives	28.3	South Africa	2.9
Bahrain	5.9	France	0	Mali	12	Spain	0
Bangladesh	22.6	Gabon	17.4	Malta	4.2	Sri Lanka	11.3
Barbados	11.2	Gambia,	42.8	Mauritania	30.1	St. Kitts& Nevis	37
Belarus	6.1	Georgia	5.6	Mauritius	25	St. Lucia	26.5
Belgium	0	Germany	0	Mexico	4.1	St Vicent and the Grenadines	40.3
Belize	49	Ghana	26.8	Moldova	5.8	Sudan	29
Benin	56	Greece	0.1	Mongolia	7.6	Suriname	22.9
Bhutan	1.9	Grenada	18.2	Morocco	15.9	Swaziland	51.9
Bolivia	5.1	Guatemala	15	Myanmar	4.1	Sweden	0.1
Botswana	12.4	Guinea	76.6	Namibia	37.1	Switzerland	1
Brazil	2.9	Guinea-Bissau	37.1	Nepal	27.2	Syrian Arab Republic	9.9
Bulgaria	2	Guyana	9	Netherlands	0	Tajikistan	15.9
Burkina Faso	14.3	Haiti	21 .4	Antilles	39.2	Tanzania	8.6
Burundi	20.2	Honduras	42.4	New Zealand	1.7	Thailand	10.4
Cameroon	28.3	Hungary	2.9	Nicaragua	7.1	Togo	35.4
Canada	1.3	Iceland	1 .3	Niger	36.4	Tonga	48.4
Cayman Islands	42.2	India	18.5	Nigeria	6.6	Trinidad and Tobago	5.7
Central African Republic	39.8	Indonesia	3.1	Norway	0.5	Tunisia	11.5

/...

Country	%	Country	%	Country	%	Country	%
Chad	15.3	Iran, Islamic Rep.	7.4	Oman	2.8	Turkey	0.9
Chile	5.3	Ireland	0	Pakistan	12.2	Uganda	49.8
China	9.5	Israel	0.6	Panama	10.7	Ukraine	4.5
Colombia	7.3	Italy	0	Papua New Guinea	27.3	27.3 United Arab Emirates	0
Comoros	54	Jamaica	7.2	Paraguay	10.3	10.3 United Kingdom	0
Congo, Dem Republic	31.9	Japan	1 .3	Peru	9.1	9.1 United States	1
Congo, Rep	7.8	Jordan	16.8	Philippines	17.2	17.2 Uruguay	2.9
Costa Rica	4.6	Kazakhstan	7	Poland	1.8	1.8 Vanuatu	36.2
Cote d'ivoire	41.8	Kenya	13.8	Portugal	0	0 Venezuela, RB	7
Croatia	6.5	Korea, Rep	6.4	Romania	3.1	3.1 Vietnam	18.1
Cyprus	3.8	Kuwait	2.8	Russian Federation	13.7	13.7 Yemen, Rep	10.3
Czech Republic	1 .4	Kyrgyz Republic	3	Rwanda	31.1	31.1 Zambia	15.8
Denmark	0	atvia	1 .2	Samoa	50.2	50.2 Zimbabwe	20.5
Djibouti	6	Lebanon	28.1	San Marino	1.4	1.4 Dominica	19.6
Lesotho	47.7	Senegal	36.5	Dominican Republic	42.8	42.8 Liberia	34.6
Seychelles	42.6						

Source: World Bank, 2003

Table A6. Sectoral aggregation

Code	Sectoral aggregation
UAF	Unprocessed agriculture and forestry
PAG	Processed agriculture
FSH	Fishing
OGM	Oil, gas and other minerals
P_C	Petroleum and coal
LUM	Lumber
PPP	Paper
TEX	Textiles
WAP	Wearing apparel
LEA	Leather
CRP	Chemical, rubber and plastics
I_S	Iron and steel
OME	Machinery and equipment
NFM	Non-ferrous metals
FMP	Metal manufactures
OMF	Other manufactures
MVH	Motor vehicles
OTN	Transport equipment
ELE	Electronic equipment
CNS	Construction
TRS	Transportation
BUS	Business services
SER	Services and activities N.E.S

Table A7. Regional aggregation

Code	Regional aggregation
EU	European Union-25
USA	United States
JPN	Japan
CAN	Canada
RDC	Rest OECD
HIA	High-income Asia
CHN	China, incl. Hong Kong
IND	India
BRA	Brazil
BGD	Bangladesh
PHL	Philippines
MWI	Malawi
ZMB	Zambia
BGR	Bulgaria
RSA	Rest of South Asia
SEA	South-East Asia
CAC	Central America and the Caribbean
AP	Andean Pact
SC	Argentina, Chile and Uruguay
MENA	Middle East and North Africa
SSA	Sub-Saharan Africa
ROW	All other regions

Table A8: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Developed)

WTO member	Bound																				Applied									
		Swiss						WTO						Capped							Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.			Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before									
Developed	**12.3**	**1.1**	**1.1**	**1.1**	**1.1**	**2.9**	**2.9**	**3.0**	**2.9**	**2.0**	**1.9**	**3.2**	**3.1**	**2.6**	**2.6**	**2.6**	**2.6**	**4.6**	**4.6**	**5.5**	**0.8**	**0.8**	**2.3**	**1.6**	**1.3**	**2.2**	**1.7**	**1.7**	**3.4**
Australia	11.0	1.3	1.3	1.3	1.3	3.2	3.2	2.7	2.7	1.8	1.8	2.8	2.9	1.9	1.9	1.9	1.9	4.5	4.6	4.6	0.9	0.9	2.4	1.6	1.2	2.1	1.6	1.6	4.0
Canada	5.3	0.9	0.9	0.9	0.9	2.3	2.3	1.1	1.1	0.7	0.7	1.3	1.3	1.0	1.0	1.0	1.0	2.4	2.4	4.4	0.7	0.7	1.9	0.9	0.6	1.1	1.0	1.0	2.3
Czech Republic	4.2	1.0	1.0	1.0	1.0	2.3	2.3	1.2	1.2	0.8	0.8	1.2	1.2	1.3	1.3	1.3	1.3	1.9	1.9	4.9	1.0	1.0	2.0	1.1	0.7	1.1	1.3	1.3	1.8
European Union-25	4.0	0.7	0.7	0.7	0.7	2.0	2.0	0.8	0.8	0.5	0.5	1.0	1.0	0.8	0.8	0.8	0.8	1.9	1.9	4.2	0.6	0.6	1.9	0.7	0.5	1.0	0.8	0.8	1.9
Hungary	6.9	1.3	1.3	1.3	1.3	3.1	3.2	2.0	2.0	1.4	1.4	2.2	2.2	2.0	2.1	2.0	2.1	3.5	3.8	8.2	1.3	1.3	3.1	2.0	1.4	2.2	2.1	2.1	3.8
Iceland	9.6	0.8	0.8	0.8	0.8	2.5	2.4	1.7	1.6	1.1	1.0	1.9	1.8	1.5	1.5	1.5	1.5	2.8	2.8	2.5	0.4	0.4	1.2	0.8	0.5	0.9	1.0	1.0	2.0
Japan	2.8	0.4	0.4	0.4	0.4	1.3	1.3	0.4	0.4	0.2	0.2	0.5	0.5	0.4	0.4	0.4	0.4	1.4	1.4	2.9	0.4	0.4	1.3	0.4	0.2	0.5	0.4	0.4	1.4
Latvia	9.4	1.3	1.3	1.3	1.3	3.3	3.3	2.4	2.4	1.6	1.6	2.7	2.6	1.1	1.1	1.1	1.1	2.3	2.3	2.2	0.4	0.4	1.1	0.5	0.4	0.9	0.6	0.6	1.4
Lithuania	8.4	1.2	1.2	1.2	1.2	3.0	3.0	2.1	2.1	1.4	1.4	2.2	2.2	0.4	0.4	0.4	0.4	1.4	1.4	2.6	0.2	0.2	0.9	0.3	0.2	0.6	0.4	0.4	1.4
Malta	49.1	2.1	2.1	2.1	2.1	5.9	5.8	16.1	15.7	10.7	10.4	16.0	15.6	13.3	13.0	13.3	13.0	20.2	19.7	7.6	1.8	1.8	5.0	4.7	4.7	7.6	4.7	4.7	7.6
New Zealand	11.0	1.0	1.0	1.0	1.0	2.7	2.7	2.2	2.2	1.4	1.4	2.3	2.3	2.7	2.7	2.7	2.7	4.9	4.9	2.8	0.8	0.8	2.0	1.2	1.1	1.8	1.2	1.2	2.7
Norway	3.2	0.5	0.5	0.5	0.5	1.5	1.5	0.5	0.5	0.3	0.3	0.6	0.6	0.3	0.3	0.3	0.3	0.9	0.9	2.1	0.2	0.2	0.8	0.2	0.1	0.3	0.3	0.3	0.9
Poland	9.7	1.6	1.6	1.6	1.6	3.7	3.8	3.2	3.2	2.2	2.1	3.3	3.3	3.0	3.2	3.0	3.2	4.8	5.5	10.4	1.6	1.6	3.8	3.1	2.1	3.3	3.2	3.2	5.4
Slovenia	23.7	1.9	1.9	1.9	1.9	5.0	5.0	7.8	7.8	5.2	5.2	7.6	7.6	7.2	7.2	7.2	7.2	10.9	10.9	9.4	1.8	1.8	4.5	5.1	4.1	6.4	5.1	5.1	8.2
Switzerland	34.6	0.7	0.7	0.7	0.7	2.5	2.5	2.7	2.7	2.0	2.0	4.2	4.2	3.3	3.3	3.3	3.3	7.6	7.5	15.1	0.7	0.7	2.4	2.6	1.9	4.1	3.1	3.1	7.4
United States	3.5	0.5	0.5	0.5	0.5	1.6	1.6	0.5	0.5	0.3	0.3	0.7	0.7	0.7	0.7	0.7	0.7	1.8	1.8	3.9	0.5	0.5	1.6	0.5	0.4	0.7	0.7	0.7	1.7

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl.**: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

Table A9: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Developing)

WTO member	Bound																			Applied									
		Swiss						WTO						Capped							Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.			Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before									
Developing	**29.4**	**8.7**	**9.1**	**11.1**	**16.8**	**14.6**	**20.4**	**12.4**	**12.7**	**23.1**	**29.7**	**25.2**	**31.8**	**11.6**	**12.1**	**16.5**	**22.3**	**18.3**	**23.9**	**11.6**	**5.3**	**7.6**	**9.1**	**6.3**	**10.4**	**10.6**	**6.8**	**10.3**	**10.6**
Albania	6.6	2.1	2.1	3.5	3.5	4.5	4.5	1.5	1.5	4.2	4.2	4.9	4.9	2.5	2.5	4.4	4.4	5.3	5.3	10.5	2.1	3.5	4.5	1.5	4.2	4.9	2.5	4.4	5.3
Antigua and Barbuda	51.4	6.8	6.6	10.0	10.0	16.8	16.8	17.2	16.8	38.4	38.4	42.7	42.7	12.4	12.1	20.1	20.1	22.0	22.0	8.9	3.7	6.5	8.0	4.8	8.8	8.8	4.8	8.8	8.8
Argentina	31.8	5.7	5.7	8.9	8.9	13.8	13.8	10.1	10.1	23.7	23.7	26.4	26.4	12.6	12.6	19.0	19.0	22.2	22.2	12.8	5.2	7.7	10.8	7.9	12.7	12.7	8.5	12.5	12.7
Armenia	7.5	1.9	1.9	3.7	3.7	4.9	4.9	1.4	1.4	4.7	4.7	5.6	5.6	0.8	0.8	2.2	2.2	2.6	2.6	2.3	0.5	1.5	2.1	0.4	2.0	2.2	0.7	2.2	2.2
Bahrain	35.1	5.4	5.2	9.2	9.5	14.6	15.4	9.1	8.4	27.3	30.6	30.0	34.1	10.9	9.6	20.5	18.8	23.5	21.1	7.6	4.1	7.1	7.5	4.4	7.6	7.6	4.5	7.6	7.6
Barbados	73.0	7.2	7.0	10.6	10.6	18.5	18.5	24.5	23.9	54.3	54.3	60.5	60.4	16.3	15.9	25.7	25.7	28.0	28.0	10.2	4.2	7.5	9.4	5.5	10.2	10.2	5.6	10.2	10.2
Belize	51.5	6.7	6.6	10.0	10.0	16.8	16.8	17.2	16.8	38.5	38.5	42.8	42.8	11.9	11.6	19.9	19.9	21.7	21.7	9.5	3.7	6.6	8.2	4.8	9.2	9.3	5.0	9.1	9.3
Bolivia	40.0	6.3	6.3	9.5	9.5	15.4	15.4	13.2	13.2	30.0	30.0	33.3	33.3	15.8	15.8	24.7	24.7	27.7	27.7	9.2	5.6	8.8	9.2	5.9	9.2	9.2	5.9	9.2	9.2
Brazil	30.8	5.7	5.7	8.8	8.8	13.6	13.6	9.7	9.7	22.9	22.9	25.5	25.5	11.8	11.8	19.3	19.3	22.7	22.7	14.4	5.0	8.0	11.4	7.4	14.4	14.4	8.1	14.1	14.4
Brunei Darussalam	24.5	5.3	5.1	8.2	8.3	12.2	12.4	7.7	7.5	18.4	19.2	20.4	21.4	2.5	2.8	4.4	5.3	5.0	6.1	3.0	1.1	2.0	2.6	1.3	3.0	3.0	1.6	3.0	3.0
Bulgaria	23.0	4.7	4.7	7.3	7.3	10.9	10.9	6.6	6.6	16.2	16.2	18.4	18.4	7.9	7.9	13.8	13.8	16.4	16.4	11.1	3.9	6.4	8.6	4.9	10.4	10.7	5.4	10.0	10.6
Cameroon	57.5	57.5	29.5	57.5	59.2	57.5	59.2	57.5	29.5	57.5	59.2	57.5	59.2	57.5	29.5	57.5	59.2	57.5	59.2	17.5	17.3	17.5	17.5	17.3	17.5	17.5	17.3	17.5	17.5
Chile	25.0	5.5	5.5	8.3	8.3	12.5	12.5	8.2	8.2	18.7	18.7	20.8	20.8	11.0	11.0	16.7	16.7	20.0	20.0	8.0	5.3	8.0	8.0	5.3	8.0	8.0	5.3	8.0	8.0
China	9.1	3.0	3.0	4.8	4.8	6.2	6.2	2.6	2.6	6.3	6.3	7.2	7.2	3.6	3.6	6.1	6.1	7.3	7.3	14.6	3.0	4.7	6.1	2.6	6.3	7.1	3.6	6.0	7.2
Colombia	35.4	6.1	6.1	9.2	9.2	14.6	14.6	11.6	11.6	26.5	26.5	29.5	29.5	12.8	12.8	20.4	20.4	23.4	23.4	11.8	4.8	7.6	10.4	6.5	11.8	11.8	6.7	11.8	11.8
Congo	16.1	16.1	29.0	16.1	57.9	16.1	57.9	16.1	29.0	16.1	57.9	16.1	57.9	16.1	29.0	16.1	57.9	16.1	57.9	17.5	17.3	17.5	17.5	17.3	17.5	17.5	17.3	17.5	17.5
Costa Rica	42.9	6.3	6.3	9.4	9.4	15.4	15.4	14.1	14.1	31.8	31.8	35.4	35.4	5.2	5.2	11.4	11.4	12.5	12.5	4.6	1.8	3.8	4.6	2.1	4.6	4.6	2.1	4.6	4.6
Côte d'Ivoire	8.6	8.6	24.7	8.6	47.4	8.6	47.4	8.6	24.7	8.6	47.4	8.6	47.4	8.6	24.7	8.6	47.4	8.6	47.4	11.7	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Croatia	5.5	1.9	1.9	3.3	3.3	4.1	4.1	1.3	1.3	3.6	3.6	4.2	4.2	2.1	2.1	3.7	3.7	4.4	4.4	10.1	1.9	3.3	4.1	1.3	3.6	4.2	2.1	3.7	4.4

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl**.: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

/…

Table A9: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Developing)

WTO member	Bound																			Applied									
		Swiss						WTO						Capped							Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.			Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before									
Cuba	9.5	9.5	25.4	9.5	48.3	9.5	48.1	9.5	25.4	9.5	48.3	9.5	48.1	9.5	25.4	9.5	48.3	9.5	48.1	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Dominica	50.0	6.7	6.6	10.0	10.0	16.7	16.7	16.8	16.4	37.6	37.8	41.7	42.0	9.7	10.1	16.2	17.0	17.7	18.6	8.4	3.2	6.1	7.6	4.3	8.3	8.3	4.5	8.3	8.3
Dominican Republic	34.2	5.7	5.7	8.9	8.9	14.0	14.0	10.5	10.5	25.2	25.2	28.2	28.2	8.9	8.9	14.2	14.2	15.9	15.9	7.8	3.2	5.1	6.7	4.4	7.8	7.8	4.6	7.8	7.8
Ecuador	21.2	4.7	4.8	7.6	7.6	11.1	11.1	6.3	6.3	15.5	15.5	17.3	17.3	8.1	8.1	14.0	14.0	16.7	16.7	13.4	4.6	7.4	10.0	5.7	12.7	13.3	6.8	12.3	13.2
Egypt	28.3	5.0	5.0	7.8	7.8	11.9	12.0	8.2	8.1	19.8	19.9	22.4	22.5	11.9	11.9	18.8	18.9	22.4	22.5	21.1	4.9	7.5	10.8	7.4	16.3	17.4	10.1	16.0	17.2
El Salvador	35.7	6.0	6.0	9.0	9.0	14.3	14.3	11.6	11.6	26.3	26.3	29.4	29.4	5.0	5.0	11.0	11.0	12.7	12.7	6.6	1.8	3.9	5.5	2.3	6.6	6.6	2.4	6.5	6.6
Gabon	15.5	4.5	4.5	6.9	6.9	9.5	9.5	5.1	5.1	11.5	11.5	12.8	12.8	6.8	6.8	10.3	10.3	12.3	12.3	17.5	4.4	6.7	9.2	5.0	10.5	11.1	6.6	9.9	10.8
Georgia	6.5	2.4	2.4	3.7	3.7	4.7	4.7	1.7	1.7	4.4	4.4	5.0	5.0	2.8	2.8	4.3	4.3	5.2	5.2	10.4	2.4	3.7	4.7	1.7	4.4	5.0	2.8	4.3	5.2
Ghana	34.7	34.7	29.5	34.7	60.0	34.7	60.0	34.7	29.5	34.7	60.0	34.7	60.0	34.7	29.5	34.7	60.0	34.7	60.0	13.8	13.1	13.8	13.8	13.1	13.8	13.8	13.1	13.8	13.8
Guatemala	27.8	27.8	29.0	27.8	50.8	27.8	50.4	27.8	29.0	27.8	50.8	27.8	50.4	27.8	29.0	27.8	50.8	27.8	50.4	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Guyana	50.0	6.6	6.6	10.0	10.0	16.7	16.7	16.5	16.5	37.5	37.5	41.7	41.7	12.3	12.3	20.3	20.3	22.0	22.0	9.6	4.0	6.4	8.1	5.0	9.4	9.5	5.1	9.3	9.4
Honduras	32.6	5.9	5.9	8.9	8.9	13.9	13.9	10.6	10.6	24.2	24.2	27.0	27.0	5.8	5.8	11.4	11.4	13.0	13.0	6.4	2.2	4.3	5.7	2.7	6.4	6.4	2.8	6.4	6.4
Hong Kong China	0.0	0.0	0.0	0.0	6.2	0.0	10.1	0.0	0.0	0.0	22.6	0.0	25.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
India	34.3	6.1	6.3	8.8	9.3	13.9	15.3	13.4	14.5	26.9	32.9	29.4	36.9	16.2	20.2	29.4	34.3	33.5	39.9	31.1	6.2	11.0	16.5	14.3	28.6	29.8	17.6	26.5	28.8
Indonesia	36.0	6.1	6.1	9.0	9.0	14.4	14.4	12.0	11.8	26.6	26.7	29.7	29.7	8.8	9.0	14.6	14.6	16.1	16.1	6.7	3.1	5.6	6.5	3.7	6.6	6.6	3.8	6.6	6.6
Jamaica	42.5	5.7	5.7	9.1	9.1	14.8	14.8	12.4	12.4	30.9	30.9	34.6	34.6	5.3	5.3	10.4	10.4	12.1	12.1	5.9	1.6	3.1	4.7	2.6	5.8	5.9	2.7	5.8	5.9
Jordan	15.2	3.8	3.8	6.0	6.0	8.5	8.5	4.2	4.2	10.5	10.5	11.9	11.9	5.7	5.7	9.0	9.0	10.8	10.8	14.1	3.3	5.1	7.0	3.6	8.6	9.6	5.4	8.5	9.9
Kenya	54.8	54.8	29.8	54.8	61.7	54.8	60.7	54.8	29.8	54.8	61.7	54.8	60.7	54.8	29.8	54.8	61.7	54.8	60.7	18.5	16.6	18.5	18.5	16.6	18.5	18.5	16.6	18.5	18.5
Korea, Republic of	10.2	2.7	2.8	4.8	4.9	6.4	6.5	2.6	2.6	7.0	7.2	7.9	8.0	3.4	3.5	6.8	7.0	8.1	8.1	7.9	2.7	5.0	6.1	2.6	6.3	6.4	3.1	6.0	6.3
Macedonia, F.Y.R			29.4		59.2		58.9		29.4		59.2		58.9		29.4		59.2		58.9	13.4	13.0	13.4	13.4	13.0	13.4	13.4	13.0	13.4	13.4

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl.**: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

/…

Table A9: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Developing)

WTO member	Bound																			Applied									
		Swiss						WTO						Capped							Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.			Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before									
Malaysia	14.9	3.5	3.3	5.8	6.5	8.2	9.2	3.7	3.5	11.2	14.0	12.2	14.9	4.1	4.7	7.6	6.9	9.1	8.1	9.1	2.1	4.4	5.7	2.3	7.3	7.8	4.0	6.9	7.8
Mauritius	20.7	20.7	29.0	20.7	77.8	20.7	77.8	20.7	29.0	20.7	77.8	20.7	77.8	20.7	29.0	20.7	77.8	20.7	77.8	29.8	17.8	28.4	28.4	17.8	28.4	28.4	17.8	28.4	28.4
Mexico	34.9	6.0	6.0	9.2	9.2	14.5	14.5	11.4	11.4	26.1	26.1	29.0	29.0	14.2	14.2	21.9	21.9	26.0	26.0	17.1	5.5	8.5	12.7	8.7	16.2	16.6	9.5	15.7	16.4
Moldova	6.0	2.1	2.1	3.5	3.5	4.4	4.4	1.5	1.5	4.0	4.0	4.6	4.6	1.5	1.5	2.9	2.9	3.4	3.4	4.1	1.3	2.5	3.0	1.0	2.8	3.1	1.4	2.7	3.2
Morocco	39.2	6.2	6.2	9.4	9.4	15.2	15.2	12.8	12.8	29.3	29.3	32.6	32.6	15.2	15.2	23.4	23.4	27.6	27.6	27.9	5.5	8.3	12.7	10.2	21.1	22.7	12.3	19.5	22.2
Nicaragua	41.5	6.3	6.3	9.6	9.6	15.5	15.5	13.4	13.4	31.0	31.0	34.5	34.5	4.3	4.3	10.0	10.0	10.9	10.9	4.1	1.5	3.3	4.1	1.8	4.1	4.1	1.8	4.1	4.1
Nigeria	48.8	48.8	30.8	48.8	64.4	48.8	62.4	48.8	30.8	48.8	64.4	48.8	62.4	48.8	30.8	48.8	64.4	48.8	62.4	25.2	20.9	25.2	25.2	20.9	25.2	25.2	20.9	25.2	25.2
Oman	11.6	3.6	3.6	5.7	5.7	7.6	7.6	3.4	3.4	8.4	8.4	9.4	9.4	4.6	4.6	7.6	7.6	9.1	9.1	4.9	2.8	4.4	4.6	2.8	4.6	4.6	2.8	4.4	4.5
Pakistan	35.3	4.4	6.0	8.8	9.8	13.9	16.2	9.4	12.3	27.8	37.1	30.4	41.4	12.9	18.1	21.7	29.5	24.2	33.3	19.8	5.9	9.8	13.4	10.4	18.4	18.6	12.4	17.7	18.2
Panama	22.8	4.6	4.6	7.4	7.4	11.1	11.1	6.5	6.5	16.3	16.3	18.4	18.4	6.7	6.7	10.9	10.9	12.6	12.6	7.0	3.0	4.9	6.2	3.7	6.6	6.6	3.9	6.4	6.5
Papua New Guinea	30.1	5.3	5.3	8.3	8.3	12.7	12.7	8.9	8.9	21.5	21.5	24.2	24.2	11.9	11.9	19.2	19.2	22.6	22.6	17.9	4.7	7.6	10.1	6.4	13.8	14.9	8.1	13.6	15.1
Paraguay	33.6	6.0	6.0	9.0	9.0	14.2	14.2	11.0	11.0	25.0	25.0	27.9	27.9	13.2	13.2	20.5	20.5	23.7	23.7	12.9	5.1	8.0	10.9	7.1	12.8	12.9	7.3	12.7	12.8
Peru	30.0	5.8	5.8	8.8	8.8	13.6	13.6	9.9	9.9	22.5	22.5	25.0	25.0	13.2	13.2	20.0	20.0	24.0	24.0	13.1	5.8	8.8	12.2	7.9	13.1	13.1	8.0	13.1	13.1
Philippines	23.4	4.3	4.5	7.6	8.6	11.4	13.4	5.6	5.8	18.6	25.4	20.1	27.8	5.5	6.5	11.9	14.0	13.2	13.9	6.8	2.9	5.6	6.3	3.3	6.8	6.8	3.6	6.8	6.8
Romania	31.6	5.8	5.8	8.8	8.8	13.7	13.7	10.2	10.2	23.4	23.4	26.1	26.1	12.6	12.6	19.1	19.1	22.7	22.7	15.8	5.2	7.9	11.3	7.9	14.7	15.2	8.8	14.1	14.9
Saint Kitts and Nevis	70.8	7.2	7.0	10.6	10.6	18.5	18.5	23.7	23.1	53.0	53.0	58.9	58.9	12.0	11.8	20.2	20.2	22.1	22.1	8.8	3.2	5.5	7.3	4.8	8.8	8.8	4.8	8.8	8.8
Saint Lucia	53.9	6.7	6.6	10.1	10.1	16.9	16.9	17.5	17.4	39.9	39.9	44.4	44.4	8.9	8.9	15.9	15.9	17.8	17.8	8.0	2.6	4.6	6.4	3.8	8.0	8.0	3.9	7.9	8.0
Saint Vincent & the Grenadines	54.4	6.7	6.6	10.1	10.1	16.9	16.9	17.6	17.5	40.3	40.3	44.9	44.9	12.3	12.3	21.3	21.3	23.1	23.1	9.0	3.8	6.3	8.0	4.9	9.0	9.0	4.9	9.0	9.0
Singapore	6.3	2.1	1.3	3.7	5.9	4.7	9.0	1.2	0.7	5.6	14.7	5.9	17.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl**.: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

/…

Table A9: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Developing)

WTO member	Bound																			Applied									
		Swiss						WTO						Capped							Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.			Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before									
South Africa	15.9	3.7	3.6	6.0	6.1	8.5	8.7	4.2	4.1	11.0	11.2	12.4	12.8	2.8	2.8	7.2	7.5	8.5	8.9	7.9	1.6	3.6	4.9	1.8	6.2	6.8	2.4	6.5	7.3
Sri Lanka	19.5	19.5	26.7	19.5	47.5	19.5	47.1	19.5	26.7	19.5	47.5	19.5	47.1	19.5	26.7	19.5	47.5	19.5	47.1	7.8	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Taiwan Prov. of China	4.8	1.4	1.4	2.8	2.8	3.5	3.5	0.9	0.9	2.9	2.9	3.4	3.4	1.4	1.4	3.2	3.2	3.8	3.8	6.3	1.4	2.8	3.4	0.9	2.9	3.4	1.4	3.1	3.7
Thailand	24.2	4.4	4.6	7.7	8.6	11.6	13.5	6.5	6.8	19.2	25.2	20.9	28.3	12.7	12.6	24.6	23.8	26.4	25.7	14.2	4.9	9.3	11.0	6.0	12.9	13.2	7.4	12.5	13.0
Trinidad and Tobago	50.5	6.4	6.4	9.8	9.8	16.4	16.4	16.0	16.0	37.5	37.5	41.8	41.8	6.9	6.9	13.4	13.4	15.3	15.3	6.7	2.1	3.8	5.6	3.2	6.6	6.6	3.2	6.5	6.6
Tunisia	40.6	4.6	6.0	9.3	9.8	14.9	16.2	9.9	14.4	31.5	38.3	34.4	41.4	10.0	19.1	25.4	32.6	30.4	37.4	28.4	5.7	10.7	17.6	13.4	27.6	27.9	15.4	26.2	27.5
Turkey	16.7	4.7	3.3	6.2	8.5	8.9	13.5	5.6	3.8	13.9	28.3	14.8	31.2	6.0	4.2	8.3	11.9	9.2	10.8	7.2	2.3	6.3	6.6	2.4	6.8	6.8	2.5	6.7	6.8
Uruguay	31.3	5.7	5.7	8.8	8.8	13.7	13.7	9.9	9.9	23.3	23.3	26.0	26.0	12.3	12.3	19.8	19.8	22.9	22.9	14.0	5.1	8.0	11.2	7.2	13.9	14.0	7.9	13.7	13.9
Venezuela	33.9	6.0	6.0	9.1	9.1	14.3	14.3	11.1	11.1	25.4	25.4	28.2	28.2	12.6	12.6	20.1	20.1	23.1	23.1	12.0	4.8	7.7	10.5	6.5	12.0	12.0	6.8	12.0	12.0
Zimbabwe	11.1	11.1	27.9	11.1	58.2	11.1	55.9	11.1	27.9	11.1	58.2	11.1	55.9	11.1	27.9	11.1	58.2	11.1	55.9	18.7	14.8	18.1	18.1	14.8	18.1	18.1	14.8	18.1	18.1

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl**.: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

Table A10: Simple Average Bound and Applied Tariffs before and after implementation of the different scenarios (Least-developed)

WTO member	Bound																				Applied									
		Swiss						WTO						Capped								Swiss			WTO			Capped		
		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.		Amb.		Mod.		Fl.				Amb.	Mod.	Fl.	Amb.	Mod.	Fl.	Amb.	Mod.	Fl.
	Before	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F	I.	F.	I.	F.	Before										
Least-developed	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**45.2**	**12.6**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**	**12.3**
Bangladesh	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3
Benin	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Burkina Faso	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	11.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Central African Rep.	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	37.9	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Chad	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5
Guinea-Bissau	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Madagascar	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Malawi	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
Maldives	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	35.1	20.5	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Mali	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	11.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Mauritania	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.6	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
Mozambique	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	99.6	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1	13.1
Myanmar	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Nepal	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	13.2	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Niger	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	38.1	11.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7	10.7
Rwanda	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	91.5	9.5	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
Senegal	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Tanzania. United Rep.	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	120.0	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
Togo	80	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Uganda	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	50.9	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
Zambia	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	42.7	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5

Legend: **I.** (Initial Coverage): Averages are calculated among the initial bound lines only – **F**. (Final Coverage): Averages are calculated among the initial and newly bound lines – **Amb.:** Ambitious; **Mod.:** Moderate; **Fl.**: Flexible**.**
Source: WTO database for Bound rates; UNCTAD (TRAINS) database for Applied rates and UNCTAD calculations

Table A11. Base export, import and labour values

Country/Region	Revenues		Firms' purchase of labour	
	Export	Imports	Unskilled	Skilled
	$ billion	$ billion	$ billion	$ billion
European Union-25	2,669	2,742	2,477	1,653
USA	892	1,290	3,697	2,606
Japan	454	414	1369	835
Canada	269	245	253	122
Rest OECD	258	238	263	183
High-income Asia	429	408	244	134
China, incl. Hong Kong	483	397	476	135
India	61	58	154	48
Brazil	69	77	163	94
Mexico	166	149	122	54
Bangladesh	8	10	18	5
Philippines	38	44	15	6
Malawi	1	1	1	0
Zambia	1	1	1	0
Bulgaria	7	8	5	1
Rest of South Asia	21	22	36	10
South-East Asia	303	227	130	41
Central America & the Caribbean.	35	53	35	14
Andean Pact	53	53	89	37
Argentina, Chile & Uruguay	60	59	109	49
Middle East & North Africa	262	275	239	104
Sub-Saharan Africa	102	104	116	39
Rest of the World	254	256	253	92
Total	**6 897**	**7 130**	**10 264**	**6 262**

Source: GTAP database. * Exports and imports are at world prices. Labour purchases include taxes and subsidies.

Table A12. Value of Output at Market Prices

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non-ferrous metals	Metal manufactures	Other manufactures	Motor vehicles
European Union-25	232	870	35	282	121	153	351	135	107	56	794	200	746	114	321	224	534
USA	187	787	4	221	198	228	395	146	111	16	721	144	790	111	291	66	470
Japan	70	322	18	85	58	30	154	38	56	8	306	154	294	48	116	73	301
Canada	32	60	2	45	19	31	44	9	8	1	47	16	50	15	21	5	65
Rest of OECD	36	81	3	60	19	9	36	7	5	2	63	16	60	27	21	16	27
High-income Asia	32	75	5	24	36	7	30	42	14	7	121	52	124	13	30	13	52
China, incl. Hong Kong	218	269	28	227	48	39	62	165	77	57	226	100	278	44	83	93	50
India	136	61	5	17	15	4	9	35	6	4	52	23	29	8	19	17	11
Brazil	35	77	0	25	14	6	18	12	7	5	44	18	28	7	15	11	18
Mexico	33	111	3	46	12	16	19	21	18	8	57	23	50	9	16	7	47
Bangladesh	15	11	2	2	0	1	1	8	4	0	2	0	0	1	1	1	0
Philippines	12	28	3	2	3	1	1	3	2	0	5	1	4	3	1	1	1
Malawi	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zambia	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Bulgaria	23	30	0	12	1	3	4	8	2	2	13	3	5	4	2	2	2
Rest of South Asia	31	14	2	4	2	1	2	12	5	1	7	2	3	1	2	2	1
South-East Asia	56	102	10	53	21	19	17	36	25	12	53	11	39	6	9	22	29
Central America and the Caribbean	14	23	1	3	3	2	3	7	7	1	9	2	4	1	2	1	2
Andean Pact	31	56	3	37	14	5	8	7	8	4	23	6	6	6	5	2	9
Argentina, Chile & Uruguay	34	62	2	21	8	7	12	6	7	4	24	4	6	9	6	6	7
Middle East and North Africa	109	88	8	191	56	21	19	19	18	8	52	8	22	11	11	24	10
Sub-Saharan Africa	69	70	5	45	19	7	11	10	3	3	21	5	9	13	9	13	8
Rest of the World	173	213	213	170	57	21	34	53	22	13	93	47	50	42	22	21	37
Total	1 581	3 410	145	1 573	725	612	1 231	779	511	212	2 734	836	2 600	495	1 004	622	1 681

Source: GTAP G5 database. UNCTAD calculations

Table A13. Changes in unskilled labour use by sector: free trade scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	Transport
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
European Union-25	-3	-1	0.3	1.9	0.7	0.9	0.5	-4.6	-9.3	-7	0.2	0.7	0.9	-1.8	0.6	0.7	0.3	
USA	5.6	1.5	0.9	0	0	-0.1	0.4	-11.1	-11.7	-16.9	-0.4	-0.6	0.3	-0.5	-0.3	-0.7	-0.8	
Japan	-4.5	-3.1	-2.2	2.8	-0.8	-1.2	-0.2	11.5	-7.4	-30.9	1.4	2.6	0.9	0.2	1	-0.6	4.8	
Canada	6	0.2	1.2	-1.3	0.5	-0.3	0.9	-19.1	-20.3	-19.4	-0.8	-0.1	0.7	-0.5	-0.8	1	-0.3	
Rest of OECD	-0.5	16.2	4.8	-4.8	-0.6	-1	-0.1	-13.9	-13.1	-4.5	-1.1	-2.1	-2.8	-3.7	-1.2	-3.1	-3.9	
High-income Asia	-3.6	0	-0.5	-1.9	5.7	-1.2	-0.5	19	9.9	32.5	2.8	-2.3	-3.2	-1.7	-0.7	2.8	6.5	
China, incl. Hong Kong	-5.1	8.2	6.3	5.9	2.5	12.2	7.1	18.5	25.1	21.9	4.1	4.5	5.3	2.3	9.4	10.7	-3.7	
India	0.8	-5.2	2.8	-3.5	6.2	6.3	3.1	20.9	64	21.4	6.8	3.3	7	-17.1	11.5	11.2	0.9	
Brazil	16.3	9.5	0.9	-2.3	1.5	1.2	-0.1	-4	-1.2	-2.8	-3.5	-2	-8.2	0.6	-4.8	-3.5	-0.7	
Mexico	-0.1	1	0.2	0.8	-0.3	2.3	2.3	-14.3	-20.5	-10.9	0.8	3.8	8.8	5.8	2.2	-6.1	8.3	
Bangladesh	0.1	3.2	5.4	-6.4	-19.6	0.3	-7.2	19.8	112.6	7.6	-1.1	-15.4	-12.3	-5.1	-15.1	-16.5	-18.7	
Philippines	0.1	0.8	1.1	-0.6	4.5	4.2	5	29.2	57.6	24.6	4.7	2.1	13.5	-1.2	-3.1	2.5	-4.1	
Malawi	12.7	10.5	18.6	-5.3	9	-5.8	3.8	-13.9	9.2	-40.2	-0.1	-26.2	-5	54.6	-18.3	-4.1	77.6	
Zambia	3.2	4.2	7.1	8.5	10.8	-3.2	-13.8	-20.5	-9.2	-16.8	8.9	7.3	-4.6	18.6	-9.9	28.4	-5.5	
Bulgaria	3.2	5.6	8.6	2.7	9.8	1.2	2.9	-3.3	-5.6	3.6	3.9	2.7	3.6	3.8	0.7	3	4.3	
Rest of South Asia	1.2	1	3.2	-1.1	-14.1	-0.7	0.1	19.4	44	3.9	-3.1	-14.2	-8.2	-7.4	-3	-0.4	-42.5	
South-East Asia	3.2	7.9	4.2	-3.9	1.5	4.3	4.6	11.5	27.2	36.7	11	-0.8	11.1	-1.1	2	3.8	-2	
Central America and the Caribbean	7.5	7.5	3.4	-0.6	10.1	-4.3	5.8	31.9	21.4	2	5.9	2.3	1.3	0.2	-1.7	-6.3	4.2	
Andean Pact	5.6	0.2	0.1	3.5	5.4	-0.1	-1	-3.7	5.2	-4.9	-1.4	-1.6	-7.1	17.2	-2.7	-3.6	-11.9	
Argentina, Chile & Uruguay	15.2	-0.1	0.3	-6.2	1.4	-6.8	-2.7	-8.2	-6.2	-11.3	-2	-1	-3.2	-8	-4.5	-3.4	17.5	
Middle East and North Africa	1.3	1.7	1.9	6.2	6.3	-2.1	1.1	-1.9	20.8	-3.6	11.8	8.3	9.7	24.4	-1.7	4.8	-0.3	
Sub-Saharan Africa	4.2	4.3	4.6	3	3	7.8	6.2	-3.9	10.4	-12.6	7.4	12.1	13.8	26.3	0.7	9.9	12.7	
Rest of the World	2.5	3.5	2.7	3.2	4.2	2.8	3.7	4.1	5.1	1.2	4.4	7.5	9.2	8.9	3.8	3.4	2.1	

Source: GTAP G5 database. UNCTAD calculations

Table A14. Changes in unskilled labour use by sector: Swiss ambitious scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non-ferrous metals	Metal manufactures	Other manufactures	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
European Union-25	-0.4	-0.5	0.1	1.3	0.5	0.4	0.1	-1.3	-6.6	-4.7	0.0	0.6	0.4	-0.5	0.2	1.0	0.3	
USA	3.6	0.1	0.6	0.2	0.2	0.0	0.3	-9.2	-9.9	-15.9	0.1	0.1	0.8	1.0	0.1	0.4	0.0	
Japan	-1.0	-0.8	-0.8	0.9	-0.4	-1.4	-0.1	11.2	-7.2	-29.8	0.5	1.6	0.5	-0.2	0.4	-0.7	3.0	
Canada	2.2	0.4	0.9	-0.2	0.5	0.0	0.6	-17.9	-19.3	-20.6	-0.4	0.2	0.5	1.6	-0.2	0.7	0.7	
Rest of OECD	-0.2	4.7	2.3	-1.7	0.3	0.0	0.1	-10.5	-10.9	-1.4	0.0	-0.5	-1.1	1.8	-0.6	0.2	-2.5	
High-income Asia	-1.8	-0.9	-0.8	-1.2	1.5	-2.9	-1.1	17.2	13.4	23.3	1.3	-2.4	-1.3	-3.6	-1.1	-1.5	1.0	
China, incl. Hong Kong	-5.9	7.1	5.6	5.5	3.9	10.1	6.5	16.3	25.6	20.8	4.5	4.3	4.8	3.4	7.4	9.5	-3.5	
India	1.3	2.3	0.8	-7.0	5.2	0.7	-0.5	8.9	38.9	7.3	-0.2	-2.5	-0.2	-24.4	3.7	-0.6	-3.6	
Brazil	12.8	1.9	-0.4	0.2	0.8	0.4	-0.1	-5.1	-1.7	-0.5	-1.0	-1.3	-6.2	0.6	-2.8	-2.2	-2.7	
Mexico	0.3	0.6	0.1	1.3	0.6	1.9	1.5	-14.3	-19.7	-10.5	0.5	3.4	5.4	5.6	2.4	-3.7	5.0	
Bangladesh	0.1	0.3	0.3	-0.1	-0.3	0.1	0.4	-0.8	4.3	-13.5	-1.4	0.1	-2.3	-0.9	-0.4	0.3	2.4	
Philippines	-0.3	1.4	0.9	-3.7	1.4	-2.7	0.7	21.5	58.3	2.3	1.3	-0.3	5.7	-4.7	-2.8	-0.8	-5.3	
Malawi	-0.8	-1.1	5.8	-6.9	1.0	0.2	0.1	42.7	90.9	-11.4	0.4	-9.6	-8.3	-14.6	-1.7	4.2	-2.7	
Zambia	0.5	0.2	0.7	-0.1	-0.5	1.1	-0.4	-9.7	-1.1	-6.9	-0.2	0.4	6.0	-1.8	0.2	17.3	1.1	
Bulgaria	1.3	2.1	3.4	1.9	4.5	0.9	1.4	-4.7	-5.0	2.6	1.4	1.8	1.7	2.1	1.0	1.6	2.1	
Rest of South Asia	0.7	1.3	1.8	-2.1	-8.7	-1.8	-0.6	9.4	33.4	-4.2	-3.4	-10.6	-6.7	-11.4	-1.9	-5.5	-35.5	
South-East Asia	0.5	3.1	2.1	-2.2	1.9	2.1	2.3	9.4	20.5	28.2	7.5	-0.6	4.0	-3.0	0.2	0.7	-3.4	
Central America and the Caribbean	1.9	2.5	1.2	-4.0	1.9	-2.0	1.9	28.0	20.2	2.7	1.8	-1.5	-3.5	-5.0	-1.0	-3.5	1.0	
Andean Pact	2.6	1.7	0.6	0.8	2.4	-0.1	0.6	-6.9	3.4	-6.9	0.9	0.3	-4.3	8.1	-0.6	-2.7	-9.0	
Argentina, Chile & Uruguay	12.0	-1.8	-1.1	-4.4	0.3	-5.4	-2.3	-8.1	-6.1	-9.1	-1.6	-3.0	-3.9	-8.0	-3.0	-1.8	9.6	
Middle East and North Africa	1.7	2.2	1.1	2.4	2.5	0.4	0.1	-11.3	14.1	-7.4	4.8	3.9	1.7	7.5	-1.5	-0.6	2.6	
Sub-Saharan Africa	1.2	2.3	2.3	0.3	-0.1	2.2	1.6	-6.1	-1.5	-12.8	2.0	4.1	1.7	11.2	0.4	1.3	3.0	
Rest of the World	1.1	2.0	1.4	0.9	1.5	0.7	1.1	-2.4	-0.5	-3.6	1.1	1.6	1.6	2.1	1.3	-0.3	0.4	

Source: GTAP G5 database. UNCTAD calculations

Table A15. Changes in unskilled labour use by sector: Swiss moderate scenario

	Unprocessed agri. and forestry	Processed agriculture	Fish and forestry	Oil, gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, Plastics	Iron and steel	Machinery and equipment	Non-ferrous metal	Metal Manufactures	Other manufactures	Motor vehicles
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
European Union-25	-0.3	-0.4	0.1	1.2	0.1	0.5	0.2	-3.4	-6.6	-4.9	0.1	0.7	0.5	-0.2	0.3	0.9	-0.1
USA	3.6	0.1	0.5	0.1	0.2	-0.1	0.2	-8.8	-9.4	-16.2	0.0	0.1	0.8	0.9	0.1	0.1	0.0
Japan	-0.9	-0.8	-0.8	1.2	-0.3	-1.0	-0.1	6.6	-7.3	-29.7	0.6	1.8	0.6	0.5	0.5	-0.3	2.5
Canada	2.3	0.4	0.8	-0.1	0.5	0.1	0.6	-17.2	-18.2	-20.9	-0.5	0.2	0.5	1.8	-0.1	0.7	0.7
Rest of OECD	-0.1	4.7	2.2	-1.6	0.6	-0.1	0.1	-9.8	-10.1	-3.9	0.1	-0.4	-0.9	1.4	-0.6	-0.8	-2.3
High-income Asia	-1.6	-0.5	0.0	-0.4	1.5	-2.2	-0.8	12.6	13.9	14.2	1.4	-2.0	-1.3	-2.3	-0.5	-0.1	2.1
China, incl. Hong Kong	-6.0	6.8	5.4	5.0	3.6	9.5	6.0	17.0	24.9	21.8	4.0	3.8	4.1	3.1	6.9	9.1	-2.5
India	1.1	1.8	0.9	-5.5	4.2	-0.1	-1.4	8.9	34.7	4.9	-1.2	-2.4	-1.1	-19.3	2.0	-1.1	-1.3
Brazil	12.3	1.5	0.2	-1.2	0.4	-0.9	-0.9	-2.2	-0.7	-3.4	-1.7	-2.2	-4.3	-0.3	-3.3	-2.4	-2.8
Mexico	0.3	0.3	0.1	1.5	0.5	1.5	1.1	-10.9	-16.6	-7.9	0.3	2.3	3.8	4.1	1.3	-3.5	3.7
Bangladesh	0.1	0.3	0.3	-0.4	-0.4	0.1	0.3	-0.1	5.9	-16.4	-1.7	-0.3	-2.1	-0.6	-0.3	0.2	0.7
Philippines	-0.2	0.9	0.8	-2.7	0.8	-2.6	0.1	19.7	36.0	-5.7	1.3	-1.3	-0.5	-4.0	-1.6	-1.3	-1.3
Malawi	-0.1	-1.1	4.8	-5.1	0.9	0.8	0.0	31.2	65.4	-9.7	0.1	-7.2	-6.5	-12.7	-1.1	3.2	-3.2
Zambia	0.5	0.1	0.5	0.1	-0.2	0.6	-0.3	-6.0	-0.7	-7.6	-0.3	-0.4	3.2	-1.5	0.2	9.7	1.9
Bulgaria	1.0	1.5	2.6	1.0	3.4	0.3	0.7	-2.4	-5.4	2.2	0.9	1.0	1.3	1.3	0.3	1.0	1.2
Rest of South Asia	0.5	1.1	1.8	-2.3	-9.2	-2.3	-0.8	7.2	30.6	-7.5	-3.4	-6.2	-6.0	-4.6	-1.7	-6.2	-1.5
South-East Asia	0.3	2.4	1.8	-2.1	1.2	0.7	1.1	10.1	17.7	24.0	6.3	-1.8	0.3	-3.1	-0.2	-0.5	2.2
Central America and the Caribbean	1.7	2.0	1.0	-4.4	1.4	-2.7	0.9	26.7	14.2	-0.5	0.6	-2.3	-4.1	-5.5	-1.7	-3.6	0.3
Andean Pact	2.3	1.0	0.4	0.0	1.8	-0.6	-0.1	-0.5	4.1	-3.8	0.1	-0.6	-1.7	5.2	-1.4	-3.3	-9.1
Argentina, Chile & Uruguay	11.8	-2.1	-1.7	-5.1	0.0	-6.0	-2.8	-7.0	-4.2	-10.6	-2.0	-3.4	-4.2	-8.8	-3.3	-2.4	11.0
Middle East and North Africa	1.5	1.8	0.9	1.9	2.1	0.0	-0.3	-8.0	8.7	-5.4	3.0	2.5	1.6	7.1	-1.5	-0.6	2.0
Sub-Saharan Africa	0.9	1.7	1.8	0.0	1.3	1.3	0.8	-1.6	-0.6	-10.3	1.3	1.9	1.7	5.3	0.4	0.1	2.4
Rest of the World	0.8	1.5	1.2	0.4	1.1	0.0	0.5	0.4	-0.4	-2.0	0.5	1.0	1.4	1.6	0.7	-0.7	0.0

Source: GTAP G5 database. UNCTAD calculations

Table A16. Changes in unskilled labour use by sector: Swiss flexible scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manu-facturers	Other manu-facturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	-0.3	-0.3	0.1	0.8	0.1	0.3	0.1	-1.9	-4.3	-2.7	0.0	0.5	0.6	-0.3	0.2	0.3	-0.1	
USA	3.4	0.1	0.3	0.1	0.1	-0.2	0.1	-6.2	-6.7	-13.2	-0.1	-0.1	0.6	0.7	0.0	-0.5	0.1	
Japan	-0.7	-0.6	-0.5	0.9	-0.2	-0.7	0.0	6.1	-4.9	-26.1	0.6	1.5	0.3	0.4	0.2	0.0	1.9	
Canada	1.8	0.1	0.5	0.1	0.5	-0.3	0.3	-12.0	-13.4	-15.9	-0.6	0.0	0.7	1.6	-0.1	-0.2	0.9	
Rest of OECD	-0.3	4.3	1.7	-1.2	0.0	-0.2	0.2	-7.2	-7.7	-5.1	0.0	-0.4	-1.0	1.2	-0.6	-1.0	-1.7	
High income Asia	-1.4	-0.5	0.0	-0.4	1.3	-1.7	-0.5	7.8	8.8	9.9	1.2	-1.4	-0.7	-1.9	-0.3	-0.8	1.8	
China including Hong Kong	-6.1	6.3	5.0	5.0	3.9	9.9	6.1	14.1	19.4	19.1	4.2	4.0	4.1	4.0	6.7	9.3	-1.8	
India	0.8	1.3	0.6	-3.3	3.4	0.1	-0.2	5.2	20.3	1.5	-0.7	-1.6	-1.0	-13.9	1.6	0.1	-0.9	
Brazil	11.6	1.0	0.0	-1.8	0.1	-2.2	-1.2	-2.0	-0.8	-9.3	-1.6	-2.3	-3.3	-1.7	-2.6	-1.9	-3.6	
Mexico	0.1	0.1	0.0	1.3	0.5	1.3	0.9	-7.4	-12.0	-6.0	0.4	1.8	3.1	3.4	1.3	-2.3	2.4	
Bangladesh	0.1	0.3	0.3	-0.5	-0.1	0.1	0.2	-0.2	4.1	-13.0	-1.2	-0.4	-1.4	-0.4	-0.2	0.1	0.4	
Philippines	-0.2	0.7	0.6	-1.4	0.6	-1.6	0.0	12.0	22.2	-3.7	1.2	-0.7	0.1	-2.5	-0.8	-0.8	-1.1	
Malawi	0.6	-0.8	3.9	-4.8	0.8	0.4	0.2	19.5	42.3	-7.9	0.3	-5.3	-4.7	-9.4	-0.7	2.5	-1.9	
Zambia	0.5	0.1	0.5	0.1	0.0	0.6	-0.2	-4.3	-0.5	-6.1	-0.3	-0.3	2.0	-0.9	0.2	8.1	2.9	
Bulgaria	0.8	1.2	2.0	0.6	2.6	0.3	0.5	-1.4	-3.7	2.1	0.6	0.6	0.9	0.8	0.5	0.8	0.9	
Rest of South Asia	0.3	0.6	1.0	-1.2	-2.9	-1.4	-0.6	2.9	19.4	-6.6	-2.1	-3.8	-3.0	-2.8	-0.9	-3.9	-0.9	
South East Asia	0.3	1.9	1.4	-1.0	1.3	0.6	1.2	5.1	10.7	14.6	6.2	-0.5	-0.1	-1.7	0.5	-0.4	1.7	
Central America and the Caribbean	1.7	1.4	0.7	-3.0	0.6	-1.7	0.4	15.7	6.9	-2.4	0.0	-1.9	-3.0	-3.7	-1.3	-2.3	0.0	
Andean Pact	1.8	0.3	0.2	-0.7	1.1	-0.3	0.4	0.0	2.3	-2.8	0.5	0.2	0.6	2.7	0.2	-2.1	-6.7	
Argentina, Chile & Uruguay	11.5	-2.5	-2.3	-4.6	-0.2	-5.9	-2.8	-6.7	-3.6	-11.1	-2.2	-3.9	-4.5	-8.8	-3.1	-2.0	7.8	
Middle East and North Africa	1.2	1.3	0.7	1.4	1.5	-0.1	-0.2	-6.3	7.0	-3.7	2.3	1.4	1.2	4.4	-1.2	-0.7	1.7	
Sub-Saharan Africa	0.7	1.4	1.4	0.3	1.2	1.3	0.6	-1.6	-1.6	-8.0	1.1	1.3	1.8	4.8	0.5	0.2	1.8	
Rest of the World	0.7	1.0	0.8	0.4	1.0	0.2	0.4	0.2	-0.5	-1.9	0.5	0.8	1.2	1.2	0.6	-0.4	0.4	

Source: GTAP G5 database. UNCTAD calculations

Table A17. Changes in Unskilled Labour Usage by Sector, WTO Ambitious Scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	-0.3	-0.5	0.1	1.5	0.4	0.4	0.0	-1.0	-6.5	-4.3	0.0	0.4	0.5	-0.6	0.2	0.8	0.3	
USA	3.6	0.1	0.5	0.2	0.2	-0.1	0.2	-9.2	-9.9	-16.1	0.0	0.2	0.8	1.0	0.2	0.5	0.2	
Japan	-1.0	-0.8	-0.8	1.0	-0.4	-1.4	-0.1	11.5	-7.2	-29.9	0.5	1.5	0.7	-0.1	0.2	-0.6	2.6	
Canada	2.2	0.4	0.9	-0.1	0.7	-0.1	0.6	-17.9	-19.3	-20.5	-0.4	0.3	0.4	1.7	-0.1	0.7	0.7	
Rest of OECD	-0.2	4.7	2.2	-1.5	-0.3	-0.1	0.2	-10.5	-11.1	-1.4	-0.3	-0.4	-1.7	2.6	-0.4	0.7	-1.0	
High income Asia	-1.8	-0.8	-0.8	-1.2	2.1	-3.4	-1.1	17.9	13.8	23.5	1.3	-2.5	-1.3	-4.0	-1.5	-1.6	0.5	
China including Hong Kong	-5.9	7.1	5.6	5.4	3.7	9.9	6.4	16.7	26.0	20.7	4.2	4.1	4.7	3.3	7.2	9.4	-3.6	
India	1.0	1.7	0.6	-6.6	6.2	1.0	1.3	6.1	32.3	2.7	1.5	-0.3	-0.7	-24.2	3.5	-3.6	-3.1	
Brazil	12.4	1.5	-0.5	-0.2	0.6	-0.4	-0.2	-6.0	-2.1	-1.9	-0.5	-1.2	-6.6	-0.3	-2.0	-1.5	-3.7	
Mexico	0.4	0.4	0.0	1.3	0.7	2.4	1.4	-14.3	-19.6	-9.9	0.5	3.3	4.4	5.5	2.8	-1.5	3.6	
Bangladesh	0.1	0.3	0.2	-0.2	-0.4	0.1	0.6	-0.8	4.2	-13.4	-1.0	0.5	-1.8	-0.7	-0.1	0.3	2.4	
Philippines	-0.3	1.3	0.9	-3.9	1.1	-2.9	0.3	20.8	58.5	0.0	1.2	-0.4	5.1	-4.8	-1.9	-0.9	-4.4	
Malawi	-0.9	-1.2	5.6	-8.8	1.0	-0.2	0.1	43.3	91.5	-11.5	0.5	-8.7	-8.2	-12.9	-1.8	4.2	-3.1	
Zambia	0.5	0.3	0.8	-0.4	-0.4	1.7	-0.2	-9.9	-1.1	-7.2	-0.1	-0.2	5.7	-1.6	0.2	23.4	1.4	
Bulgaria	1.2	1.8	3.1	1.8	1.6	1.0	1.2	-5.0	-5.3	2.4	1.2	1.6	1.5	1.9	1.3	1.5	1.9	
Rest of South Asia	0.4	0.7	1.4	-1.9	-0.8	-1.6	0.0	6.8	30.7	-6.6	-1.8	-7.1	-5.3	-14.4	-0.9	-5.9	-29.6	
South East Asia	0.5	3.0	2.1	-2.2	1.9	1.6	2.1	9.4	20.5	28.1	7.5	0.0	2.8	-3.3	0.7	0.3	-3.3	
Central America and the Caribbean	1.9	2.3	1.1	-4.2	1.1	-1.2	1.5	27.9	20.1	1.9	1.2	-2.3	-4.8	-5.4	-1.5	-3.7	0.9	
Andean Pact	2.2	1.3	0.4	0.1	1.6	0.4	1.2	-8.0	2.6	-7.1	1.6	1.3	-3.2	5.6	1.2	-0.7	-5.6	
Argentina, Chile & Uruguay	12.0	-1.9	-1.2	-4.0	0.1	-5.2	-2.3	-8.5	-6.4	-8.8	-1.9	-3.6	-4.7	-8.5	-2.7	-1.0	4.8	
Middle East and North Africa	1.5	1.9	0.9	2.0	1.8	0.8	0.6	-12.3	13.3	-7.8	3.7	1.9	0.6	4.1	-0.4	0.2	2.2	
Sub-Saharan Africa	1.1	2.2	2.2	0.4	-0.1	1.6	1.4	-6.2	-1.7	-12.8	1.7	3.1	1.3	14.2	0.4	1.3	2.4	
Rest of the World	1.0	1.9	1.3	0.8	1.5	0.8	1.0	-2.5	-0.6	-3.6	1.1	1.5	1.3	2.0	1.2	0.1	0.9	

Source: GTAP G5 database. UNCTAD calculations

Table A18. Changes in Unskilled Labour by Sector, WTO Moderate Scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	0.0	-0.3	0.1	1.5	0.3	0.6	0.1	-5.8	-7.1	-4.4	0.2	0.7	0.7	-0.2	0.2	0.4	-0.6	
USA	3.6	0.1	0.5	0.1	0.2	-0.1	0.2	-8.1	-8.9	-16.1	-0.1	0.1	0.8	1.0	0.1	0.1	0.1	
Japan	-0.8	-0.8	-0.8	1.0	-0.4	-1.3	-0.1	6.0	-7.2	-30.4	0.6	1.5	0.7	0.5	0.3	-0.2	3.0	
Canada	2.4	0.4	0.8	0.1	0.7	0.2	0.7	-16.4	-17.5	-20.8	-0.7	0.3	0.6	2.3	-0.2	1.1	0.3	
Rest of OECD	0.0	4.7	2.1	-1.1	0.4	-0.4	0.0	-9.2	-9.8	-4.2	0.0	-0.3	-1.3	2.6	-0.8	-0.8	-1.6	
High income Asia	-1.4	-0.4	0.1	-0.7	1.9	-2.7	-1.0	13.0	14.8	12.5	1.2	-1.9	-1.3	-2.7	-0.2	0.5	2.0	
China including Hong Kong	-6.0	6.6	5.3	4.7	3.7	8.9	5.7	17.4	25.2	21.1	3.8	3.6	3.7	2.9	6.4	8.8	-1.9	
India	0.5	0.5	0.6	-1.1	0.9	-0.3	0.0	5.5	22.3	-2.3	-0.2	-1.3	-2.1	-4.3	0.3	-2.3	0.7	
Brazil	11.3	0.4	0.0	-2.7	-0.1	-2.7	-1.8	-0.7	-0.1	-7.8	-1.5	-2.9	-3.4	-1.9	-2.3	-1.2	-2.2	
Mexico	0.3	-0.2	0.0	1.5	0.4	1.7	0.7	-8.0	-13.5	-4.5	0.2	1.5	1.8	3.0	1.2	0.5	1.3	
Bangladesh	0.0	0.3	0.3	-0.4	-0.4	0.0	0.4	0.2	6.2	-16.1	-1.3	0.1	-1.1	0.0	0.1	0.1	-0.4	
Philippines	-0.2	0.9	0.8	-2.8	0.8	-3.1	0.0	20.8	35.6	-5.0	0.8	-1.4	-1.8	-3.6	-1.6	-1.2	0.0	
Malawi	1.1	-1.0	3.2	-4.9	0.6	0.0	0.2	12.1	27.9	-7.6	0.3	-3.2	-3.9	-8.6	-0.5	1.7	-4.5	
Zambia	0.4	0.1	0.2	0.0	-0.1	0.0	-0.3	-4.2	-0.5	-6.3	-0.3	0.0	1.3	-0.6	0.2	2.0	4.2	
Bulgaria	0.6	0.7	1.5	0.5	1.4	0.2	0.2	-2.3	-5.6	1.8	0.1	0.4	0.5	0.3	0.4	0.4	0.5	
Rest of South Asia	0.2	0.5	1.4	-2.3	-0.1	-1.9	0.3	5.1	25.3	-9.0	-1.3	-2.6	-3.1	-6.7	-0.3	-6.4	-0.7	
South East Asia	0.2	2.1	1.7	-1.6	1.2	0.0	0.6	11.6	18.4	22.4	5.5	-0.9	-2.4	-3.5	0.0	-1.0	2.5	
Central America and the Caribbean	1.5	1.4	0.7	-4.3	0.2	-2.1	-0.1	25.9	12.2	-3.4	-0.5	-3.4	-5.8	-6.2	-2.5	-3.6	0.3	
Andean Pact	1.6	0.1	0.1	-1.0	0.1	-0.2	0.0	3.5	4.2	-1.0	-0.1	-0.6	-0.5	-0.2	0.0	-1.1	-2.1	
Argentina, Chile & Uruguay	11.8	-2.4	-2.0	-4.2	-0.4	-5.9	-2.9	-7.6	-4.2	-10.2	-2.4	-4.3	-5.6	-9.7	-3.3	-1.1	2.5	
Middle East and North Africa	0.8	0.7	0.4	0.7	1.1	0.0	0.1	-2.6	-1.1	-2.7	1.8	0.5	0.1	2.5	-0.2	-1.8	1.3	
Sub-Saharan Africa	0.7	1.3	1.5	0.0	0.9	0.3	0.5	0.6	2.6	-6.7	0.7	2.1	1.2	1.4	0.6	-0.4	4.2	
Rest of the World	0.7	1.1	1.0	0.1	0.8	0.0	0.2	0.8	1.1	-1.3	0.5	0.8	0.5	1.3	0.2	0.1	0.9	

Source: GTAP G5 database. UNCTAD calculations

Table A19. Changes in Unskilled Labour Usage by Sector, WTO Flexible Scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastic	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	-0.1	-0.3	0.1	1.2	0.2	0.4	0.1	-4.8	-5.9	-3.4	0.1	0.5	0.8	-0.4	0.2	0.2	-0.6	
USA	3.6	0.1	0.4	0.2	0.2	-0.1	0.2	-7.1	-7.8	-15.0	-0.1	0.0	0.7	0.9	0.0	0.0	0.0	
Japan	-0.7	-0.7	-0.7	1.0	-0.4	-1.2	-0.1	5.4	-6.5	-29.7	0.6	1.5	0.4	0.5	0.3	0.0	3.0	
Canada	2.2	0.3	0.7	0.2	0.6	0.0	0.6	-14.3	-15.5	-18.6	-0.8	0.1	0.8	2.3	-0.4	0.6	0.2	
Rest of OECD	-0.2	4.5	1.9	-1.1	0.3	-0.6	0.0	-7.3	-7.9	-4.8	0.0	-0.3	-1.3	2.4	-0.8	-1.0	-1.6	
High income Asia	-1.4	-0.5	0.1	-0.7	1.8	-2.4	-0.8	10.9	13.0	10.5	1.2	-1.7	-1.3	-2.4	0.1	0.3	2.2	
China including Hong Kong	-6.1	6.4	5.1	4.8	3.9	9.1	5.7	16.2	22.6	20.2	4.0	3.7	3.7	3.3	6.4	8.9	-1.4	
India	0.3	0.3	0.4	-0.3	0.6	-0.3	0.1	4.2	17.4	-3.4	0.2	-0.9	-2.0	-1.8	0.2	-1.6	1.2	
Brazil	11.2	0.4	-0.1	-2.6	-0.2	-2.8	-1.8	-1.0	-0.2	-10.0	-1.5	-2.8	-3.4	-1.9	-2.2	-1.3	-1.8	
Mexico	0.2	-0.2	0.0	1.3	0.4	1.6	0.6	-7.2	-12.1	-4.0	0.2	1.4	2.1	2.9	1.0	0.6	1.2	
Bangladesh	0.0	0.3	0.3	-0.3	-0.3	0.0	0.3	0.3	5.5	-14.7	-1.3	0.0	-1.1	0.0	0.1	0.1	-0.5	
Philippines	-0.2	0.8	0.8	-2.2	0.8	-2.7	0.1	18.0	31.1	-1.7	0.8	-1.1	-1.8	-3.1	-1.3	-1.1	0.0	
Malawi	1.4	-0.9	2.9	-4.0	0.5	0.1	0.2	6.1	16.1	-6.7	0.3	-2.4	-3.1	-7.3	-0.3	1.4	-4.1	
Zambia	0.4	0.0	0.2	0.0	-0.1	-0.1	-0.3	-3.2	-0.4	-5.1	-0.2	0.1	0.9	-0.5	0.2	0.3	4.9	
Bulgaria	0.5	0.7	1.4	0.5	0.9	0.2	0.2	-2.0	-5.0	2.1	0.1	0.3	0.5	0.2	0.3	0.3	0.4	
Rest of South Asia	0.1	0.4	1.2	-1.8	-0.1	-1.6	0.3	3.9	21.8	-8.3	-1.0	-2.0	-2.6	-5.0	-0.2	-5.4	-0.5	
South East Asia	0.2	1.9	1.5	-1.2	1.2	0.4	0.8	9.5	15.7	18.8	5.4	-0.6	-2.2	-2.8	0.1	-1.0	2.5	
Central America and the Caribbean	1.6	1.3	0.6	-3.8	0.2	-1.9	0.0	22.5	10.4	-3.6	-0.4	-3.0	-5.1	-5.4	-2.2	-3.2	0.5	
Andean Pact	1.6	0.0	0.1	-1.0	0.2	-0.2	0.0	2.9	3.6	-1.2	-0.1	-0.6	-0.5	0.1	0.0	-1.0	-1.0	
Argentina, Chile & Uruguay	11.7	-2.5	-2.1	-4.0	-0.4	-5.9	-2.9	-7.1	-3.8	-10.4	-2.4	-4.3	-5.4	-9.5	-3.3	-1.1	1.1	
Middle East and North Africa	0.8	0.6	0.4	0.5	1.0	0.0	0.1	-2.0	-1.1	-2.0	1.7	0.6	0.4	2.2	0.0	-1.7	1.0	
Sub-Saharan Africa	0.6	1.1	1.3	0.1	0.8	0.3	0.5	0.8	2.8	-5.5	0.6	2.0	1.3	0.6	0.6	-0.3	4.7	
Rest of the World	0.6	1.0	0.9	0.1	0.8	0.1	0.2	0.7	1.0	-1.5	0.5	0.8	0.4	1.2	0.3	0.1	0.8	

Source: GTAP G5 database. UNCTAD calculations

Table A20. Changes in Unskilled Labour Usage by Sector, Capped Ambitious Scenario

	Unpro-cessed agri and forestry	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastic	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
Euopean Union 25	-0.3	-0.5	0.1	1.3	0.5	0.4	0.0	-0.8	-6.4	-4.5	0.0	0.4	0.4	-0.4	0.1	0.6	0.4
USA	3.6	0.1	0.5	0.4	0.2	0.0	0.2	-9.2	-9.9	-15.4	0.0	0.2	0.8	1.0	0.2	0.8	0.0
Japan	-0.9	-0.8	-0.7	0.5	-0.4	-1.1	-0.1	11.9	-6.9	-28.2	0.4	1.3	1.0	-0.1	0.1	-0.7	1.7
Canada	2.2	0.4	0.8	0.3	0.7	0.0	0.6	-17.8	-19.3	-19.9	-0.5	0.2	0.4	1.6	0.0	1.0	0.4
Rest of OECD	-0.3	4.7	2.2	-1.2	-0.2	-0.3	0.1	-10.4	-11.1	-1.0	-0.3	-0.4	-1.9	2.7	-0.5	1.2	-0.6
High income Asia	-1.7	-0.8	-0.8	-2.0	1.7	-3.4	-1.0	18.5	14.2	23.5	1.3	-2.6	-1.1	-4.4	-1.3	-2.7	-0.4
China including Hong Kong	-5.9	7.0	5.6	5.2	3.9	9.7	6.3	16.5	25.9	20.3	4.3	4.0	4.6	3.3	6.9	9.1	-2.3
India	0.9	1.5	0.5	-6.5	6.1	1.2	1.6	5.2	30.3	1.2	2.5	0.7	-1.1	-24.4	3.5	-4.1	-1.6
Brazil	12.2	1.3	-0.6	-0.3	0.5	-0.8	-0.4	-6.2	-2.2	-1.2	-0.4	-1.3	-7.0	-1.2	-1.6	-0.9	-2.6
Mexico	0.4	0.3	0.0	1.5	0.7	2.5	1.3	-14.3	-19.6	-9.4	0.5	3.1	4.2	5.3	2.9	-0.2	3.0
Bangladesh	0.1	0.3	0.2	-0.3	-0.1	0.0	0.5	-0.8	4.2	-13.6	-0.8	0.6	-1.7	-0.6	0.0	0.2	2.9
Philippines	-0.3	1.2	0.9	-3.9	1.0	-2.7	0.2	19.9	58.6	-11.7	1.1	-0.5	5.0	-4.3	-1.1	-1.0	3.9
Malawi	-0.9	-1.3	5.5	-8.7	0.9	-1.2	0.1	43.5	91.9	-11.4	0.6	-8.3	-8.1	-12.1	-1.8	4.1	-2.7
Zambia	0.4	0.3	0.8	-0.4	-0.3	2.0	-0.2	-10.1	-1.1	-7.1	0.0	-0.3	5.5	-1.4	0.3	25.8	3.6
Bulgaria	1.1	1.5	2.8	1.8	2.7	1.0	1.1	-5.3	-5.6	2.6	0.9	1.4	1.2	1.6	1.2	1.3	1.8
Rest of South Asia	0.2	0.6	1.4	-2.5	0.2	-1.6	0.4	5.6	29.2	-9.5	-1.3	-3.7	-5.5	-14.6	-0.2	-6.6	-3.7
South East Asia	0.3	2.7	1.9	-2.0	1.6	0.0	1.6	8.7	20.0	26.4	6.3	0.9	1.5	-3.8	1.2	-0.4	-0.4
Central America and the Caribbean	1.8	2.3	1.1	-3.9	1.2	-1.0	1.4	28.0	20.2	1.7	1.2	-2.4	-5.0	-5.4	-1.5	-3.8	0.6
Andean Pact	2.1	1.2	0.4	0.1	1.5	0.6	1.1	-8.2	2.4	-7.1	1.4	1.1	-3.5	4.6	1.2	0.2	-2.7
Argentina, Chile & Uruguay	12.0	-1.9	-1.2	-3.7	0.0	-5.0	-2.3	-8.6	-6.4	-8.0	-2.0	-3.6	-5.1	-8.1	-2.7	-0.3	1.3
Middle East and North Africa	1.4	1.7	0.9	2.0	1.4	1.2	0.9	-12.8	12.9	-8.1	3.3	1.2	0.1	3.1	0.7	0.9	0.4
Sub-Saharan Africa	1.0	2.1	2.2	0.5	-0.3	1.7	1.3	-6.5	-2.1	-12.5	1.6	2.6	0.9	14.6	0.6	1.0	3.5
Rest of the World	1.0	1.8	1.3	0.9	1.4	0.8	1.0	-2.6	-0.7	-3.4	1.0	1.6	1.1	1.8	1.0	0.2	1.4

Source: GTAP G5 database. UNCTAD calculations

Table A21. Changes in Unskilled Labour Usage by Sector, Capped Moderate Scenario

	Unpro-cessed agri and forestrf	Processed agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing Apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	-0.1	-0.3	0.1	1.2	0.3	0.6	0.1	-5.8	-7.4	-5.1	0.3	0.7	0.6	0.2	0.3	0.4	0.1	
USA	3.6	0.1	0.4	0.3	0.2	-0.1	0.2	-8.2	-9.1	-15.7	-0.1	0.1	0.8	0.9	0.1	0.0	0.1	
Japan	-0.7	-0.8	-0.8	0.9	-0.3	-0.8	0.0	6.7	-7.1	-28.2	0.6	1.6	1.0	0.7	0.3	-0.2	1.7	
Canada	2.2	0.3	0.7	0.5	0.7	0.0	0.6	-16.6	-17.8	-20.0	-0.5	0.2	0.4	1.9	0.0	1.1	0.3	
Rest of OECD	-0.1	4.6	2.0	-1.0	0.0	-0.4	0.1	-9.5	-10.1	-4.2	-0.2	-0.3	-1.5	1.7	-0.5	-0.6	-0.6	
High income Asia	-1.4	-0.4	0.2	-0.9	1.8	-2.6	-0.7	13.6	15.1	12.7	1.3	-1.9	-1.1	-2.6	-0.8	-0.7	0.4	
China including Hong Kong	-5.9	6.7	5.3	4.5	3.5	9.0	5.7	17.5	25.6	21.3	3.6	3.4	3.7	2.8	6.3	8.9	-1.3	
India	0.6	0.6	0.6	-1.7	1.5	-0.2	-0.2	5.8	23.9	-1.9	-0.4	-1.5	-2.3	-6.7	0.7	-1.8	0.2	
Brazil	11.4	0.5	0.0	-2.5	-0.1	-2.9	-1.6	-0.6	-0.1	-6.2	-1.6	-2.8	-3.3	-2.7	-2.2	-1.2	-2.8	
Mexico	0.3	-0.1	0.0	1.7	0.4	1.7	0.7	-8.3	-14.0	-4.9	0.3	1.5	2.0	3.2	1.4	0.1	1.3	
Bangladesh	0.0	0.3	0.3	-0.4	-0.4	0.0	0.3	0.1	6.2	-16.8	-1.4	-0.2	-1.5	-0.1	0.0	0.1	-0.2	
Philippines	-0.2	0.8	0.8	-2.8	0.6	-2.9	-0.1	20.5	35.9	-18.6	0.8	-1.6	-1.4	-3.4	-1.5	-0.9	0.3	
Malawi	1.5	-0.9	2.9	-3.8	0.5	0.3	0.2	4.9	14.5	-7.0	0.3	-2.6	-3.2	-6.6	-0.3	1.3	-2.8	
Zambia	0.4	0.1	0.3	0.1	0.0	0.3	-0.3	-4.5	-0.4	-6.4	-0.3	-0.1	1.7	-0.5	0.2	4.7	4.7	
Bulgaria	0.6	0.8	1.6	0.6	1.3	0.2	0.2	-2.3	-5.8	2.2	0.2	0.4	0.6	0.5	0.4	0.4	0.6	
Rest of South Asia	0.2	0.5	1.4	-2.8	-0.1	-1.9	0.3	5.0	26.7	-11.4	-1.5	-2.6	-3.0	-7.6	-0.3	-6.5	-0.7	
South East Asia	0.2	2.1	1.7	-1.4	1.1	-1.0	0.7	11.7	18.6	21.6	5.2	-0.8	-2.3	-3.4	-0.2	-0.9	1.7	
Central America and the Caribbean	1.5	1.4	0.7	-4.0	0.4	-2.1	0.0	25.8	11.9	-3.6	-0.4	-3.4	-5.7	-6.0	-2.5	-3.5	-0.5	
Andean Pact	1.6	0.2	0.1	-0.9	0.2	-0.2	0.1	3.5	4.1	-1.0	-0.1	-0.6	-0.5	-0.4	0.0	-1.1	-2.9	
Argentina, Chile & Uruguay	11.7	-2.4	-2.0	-4.2	-0.3	-5.7	-2.9	-7.6	-4.3	-10.0	-2.4	-4.3	-5.6	-9.2	-3.2	-1.1	3.3	
Middle East and North Africa	0.9	0.8	0.5	1.0	1.1	-0.1	-0.1	-3.3	-0.2	-3.0	1.8	0.3	0.2	2.6	-0.4	-1.4	0.5	
Sub-Saharan Africa	0.7	1.2	1.5	0.2	0.9	0.5	0.4	0.4	3.9	-6.4	0.6	1.3	1.0	2.5	0.4	-0.4	2.8	
Rest of the World	0.7	1.2	1.0	0.2	0.8	0.0	0.2	0.7	0.9	-1.3	0.4	0.8	0.6	1.1	0.2	0.1	0.6	

Source: GTAP G5 database. UNCTAD calculations

Table A22. Changes in Unskilled Labour Usage by Sector, Capped Flexible Scenario

	Unprocessed agri and forestry	Processed agriculture	Fish and forestry	Oil, gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemical, rubber, plastic	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles	L
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	-0.2	-0.2	0.1	0.7	0.2	0.3	0.0	-3.1	-3.5	-2.5	0.1	0.4	0.5	-0.2	0.1	-0.2	0.0	
USA	3.3	0.0	0.2	0.1	0.2	-0.2	0.1	-4.7	-4.9	-9.9	-0.2	-0.2	0.5	0.5	-0.1	-0.6	-0.1	
Japan	-0.7	-0.6	-0.5	0.6	-0.3	-0.9	0.0	5.7	-4.4	-13.8	0.5	1.3	0.4	0.3	0.2	-0.1	1.8	
Canada	1.7	0.1	0.4	0.4	0.5	-0.4	0.4	-9.0	-9.8	-11.2	-0.8	-0.2	0.4	1.4	-0.4	0.1	0.1	
Rest of OECD	-0.4	4.0	1.5	-1.0	0.0	-0.6	0.1	-4.2	-2.7	-2.7	-0.2	-0.3	-1.4	1.4	-0.6	-1.3	-0.4	
High income Asia	-1.3	-0.5	0.1	-0.5	1.5	-1.8	-0.4	6.7	5.5	7.2	1.3	-1.0	-0.2	-1.5	0.1	-0.6	1.1	
China including Hong Kong	-6.2	5.9	4.8	4.8	3.9	10.1	6.0	13.1	17.4	15.8	4.2	4.1	4.4	4.4	6.7	9.8	-0.6	
India	0.3	0.3	0.4	-0.1	0.9	0.0	0.2	2.7	9.6	-1.6	0.4	-0.6	-1.8	-2.1	0.5	-0.2	0.9	
Brazil	11.0	0.5	-0.3	-2.5	-0.2	-3.0	-1.7	-1.4	-0.4	-9.3	-1.5	-2.7	-3.2	-2.6	-2.1	-1.3	-2.0	
Mexico	0.1	-0.1	0.0	1.2	0.4	1.3	0.7	-4.5	-8.0	-3.1	0.4	1.1	1.6	2.4	1.0	0.2	0.9	
Bangladesh	0.1	0.3	0.3	-0.1	-0.2	0.0	0.2	-0.4	3.7	-9.2	-0.9	0.1	-0.9	0.0	0.0	0.0	-0.1	
Philippines	-0.2	0.5	0.5	-0.7	0.5	-1.2	0.1	9.1	16.7	-3.8	0.9	-0.4	-0.1	-1.5	-0.5	-0.2	0.5	
Malawi	1.8	-0.6	2.5	-2.8	0.5	0.3	0.3	-1.2	1.3	-5.3	0.3	-1.7	-2.2	-5.3	-0.1	0.9	-1.7	
Zambia	0.4	0.1	0.3	0.0	0.0	0.0	-0.2	-2.6	-0.3	-3.8	-0.3	0.0	1.0	-0.3	0.2	1.2	4.8	
Bulgaria	0.5	0.7	1.4	0.5	0.8	0.2	0.2	-1.1	-2.6	-1.0	0.2	0.3	0.5	0.3	0.3	0.3	0.5	
Rest of South Asia	0.2	0.3	0.7	-1.0	0.1	-0.9	0.2	1.5	12.5	-5.7	-0.5	-1.0	-1.3	-3.2	0.0	-3.4	-0.1	
South East Asia	0.3	1.6	1.2	-0.3	1.1	0.4	1.2	4.1	7.8	6.5	5.5	0.2	-1.0	-1.0	0.4	-0.6	1.5	
Central America and the Caribbean	1.8	1.2	0.6	-1.8	0.3	-1.2	0.2	9.9	3.4	-2.9	-0.2	-1.5	-2.7	-2.7	-1.1	-1.8	0.0	
Andean Pact	1.5	-0.1	0.0	-0.6	0.3	-0.2	0.1	1.1	1.5	-1.0	0.0	-0.4	-0.2	0.3	0.0	-0.9	-1.1	
Argentina, Chile & Uruguay	11.5	-2.6	-2.5	-3.9	-0.3	-5.6	-2.8	-6.4	-3.2	-9.3	-2.4	-4.1	-5.2	-8.9	-3.2	-1.2	1.2	
Middle East and North Africa	0.8	0.6	0.4	0.6	0.9	0.0	0.1	-1.7	0.5	-1.5	1.6	0.4	0.5	2.1	-0.1	-1.4	0.5	
Sub-Saharan Africa	0.6	1.0	1.1	0.4	0.9	0.5	0.5	0.0	2.3	-3.9	0.6	1.5	1.4	1.6	0.5	-0.2	2.5	
Rest of the World	0.6	0.8	0.7	0.3	0.8	0.1	0.3	-0.1	-0.3	-1.3	0.4	0.8	0.7	1.2	0.4	0.1	0.8	

Source: GTAP G5 database. UNCTAD calculations

Table A23. Base Output

	Unprocssed agri. and forestry	Processed agriculture	Fish and forestry	Oil, gas and other minerals	Petroleu m and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastics	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manufacturers	Other manufacturers	Motor vehicles
	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m	$m
Euopean Union 25	236.9	856.4	36.2	279.9	122.1	152.4	350.0	134.9	106.8	55.8	795.3	200.9	753.9	114.7	320.3	221.8	545
USA	191.6	781.3	3.8	220.2	196.9	227.2	392.9	145.0	110.6	16.0	717.6	143.4	788.1	110.6	290.2	64.3	467
Japan	71.9	287.0	16.5	80.3	58.2	29.5	146.8	36.6	54.5	7.5	293.2	149.0	282.8	46.0	110.1	70.7	296
Canada	31.3	59.5	2.0	43.2	18.9	31.0	43.8	9.1	7.8	1.2	46.5	15.5	49.3	14.5	20.6	5.4	64
Rest of OECD	36.8	81.2	3.4	59.3	19.1	9.0	36.2	6.5	5.0	1.8	62.3	16.3	59.9	27.5	21.1	16.5	26
High income Asia	32.1	70.7	4.7	24.0	37.3	7.0	30.1	41.3	13.6	6.6	120.6	52.1	123.3	13.3	30.2	12.9	50
China including Hong Kong	211.3	251.1	27.8	215.8	44.7	37.4	59.9	155.9	72.7	54.8	212.7	95.3	265.7	42.2	80.2	89.5	47
India	140.1	61.0	4.7	17.0	14.8	4.2	8.4	33.9	6.2	3.8	50.7	22.3	27.5	7.4	18.2	16.1	10
Brazil	33.8	72.4	0.2	23.7	13.2	6.1	17.3	11.6	6.3	4.9	41.8	16.8	26.4	6.9	14.4	10.3	17
Mexico	33.5	108.3	3.3	45.7	11.6	15.0	18.1	19.9	16.0	8.1	55.8	22.9	48.2	8.2	14.1	7.0	45
Bangladesh	14.5	11.0	2.4	1.4	0.3	1.0	0.6	8.2	4.0	0.4	1.9	0.0	0.5	0.9	0.7	0.7	0.
Philippines	11.1	25.5	3.1	1.8	2.9	1.1	1.0	2.1	2.3	0.4	4.1	0.8	3.6	2.5	1.2	1.0	1.
Malawi	0.9	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.
Zambia	1.0	0.8	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	1.0	0.0	0.1	0.
Bulgaria	23.0	29.8	0.1	12.4	1.1	2.9	4.2	8.3	1.8	1.9	12.7	3.3	5.0	4.5	2.0	1.8	1.
Rest of South Asia	31.3	13.9	2.0	3.6	1.6	0.7	1.6	12.4	4.7	0.9	7.0	2.1	3.0	0.8	2.1	1.8	1.
South East Asia	55.4	94.4	9.7	51.9	18.8	18.7	16.5	35.1	24.0	11.6	51.5	11.2	38.3	6.1	9.0	21.4	27
Central America and the Caribbean	14.3	22.8	1.0	3.4	3.0	1.8	3.2	6.8	6.9	1.0	8.9	2.1	3.6	1.4	2.0	1.4	2.
Andean Pact	30.9	55.3	2.5	36.9	13.3	5.0	8.2	7.3	7.7	3.5	22.4	6.3	5.9	5.6	4.6	2.3	8.
Argentina, Chile & Uruguay	32.5	60.5	1.8	19.7	7.8	7.0	11.1	5.7	6.5	4.3	23.1	4.9	6.4	9.2	5.7	5.5	6.
Middle East and North Africa	101.7	83.1	7.5	188.6	51.5	18.9	18.1	18.3	17.8	8.1	50.6	7.9	21.5	10.0	10.6	23.1	9.
Sub-Saharan Africa	68.8	69.2	5.4	44.6	18.5	6.7	11.3	9.6	3.5	2.8	21.2	5.5	9.4	13.1	8.7	13.1	8.
Rest of the World	175.9	213.4	5.6	158.5	52.3	21.5	33.5	53.4	21.5	13.3	93.7	47.0	51.0	42.5	22.3	21.5	37

Source: GTAP 6.5 database. UNCTAD calculations

Table A24. Change in output relative to base following WTO moderate scenario

	Unprocessed agri and forestry	Processed Agriculture	Fish and forestry	Oil, Gas and other minerals	Petroleum and coal	Lumber	Paper	Textiles	Wearing apparel	Leather	Chemicals, rubber, plastica	Iron and steel	Machinery and equipment	Non ferrous metals	Metal manu-facturers	Other manu-facturers	Motor
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
Euopean Union 25	0.0	-0.3	0.0	1.4	0.2	0.6	0.1	-5.8	-7.1	-4.4	0.2	0.7	0.7	-0.2	0.2	0.4	-0
USA	2.7	0.0	0.3	0.1	0.2	-0.1	0.1	-8.1	-8.9	-16.1	-0.1	0.1	0.8	1.0	0.1	0.0	0
Japan	-0.6	-0.8	-0.5	0.9	-0.4	-1.3	-0.1	6.0	-7.2	-30.4	0.6	1.5	0.7	0.5	0.3	-0.2	3
Canada	2.0	0.3	0.5	0.1	0.5	0.2	0.7	-16.4	-17.5	-20.8	-0.7	0.3	0.6	2.3	-0.3	1.0	0
Rest of OECD	-0.1	4.7	1.1	-0.8	0.3	-0.4	0.1	-9.2	-9.8	-4.2	0.1	-0.2	-1.3	2.6	-0.7	-0.8	-1
High income Asia	-0.9	-0.2	0.1	-0.6	2.0	-2.5	-0.8	13.1	14.9	12.6	1.4	-1.7	-1.1	-2.6	0.0	0.6	2
China including Hong Kong	-5.4	4.8	2.9	2.4	1.1	5.2	1.9	12.8	21.3	17.4	-0.4	0.3	-0.4	-0.7	2.7	3.7	-5
India	0.3	0.2	0.4	-1.0	0.6	-0.4	-0.2	5.4	22.2	-2.4	-0.4	-1.5	-2.3	-4.4	0.1	-2.5	0
Brazil	9.6	-0.1	0.0	-2.2	-0.2	-2.8	-1.8	-0.8	-0.1	-7.9	-1.5	-3.0	-3.5	-2.0	-2.3	-1.3	-2
Mexico	0.2	-0.3	0.0	1.2	0.3	1.6	0.6	-8.1	-13.6	-4.6	0.1	1.4	1.7	2.9	1.0	0.4	1
Bangladesh	0.0	0.2	0.1	-0.3	-0.5	0.0	0.3	0.2	6.2	-16.1	-1.4	0.1	-1.2	-0.1	0.1	0.0	-0
Philippines	-0.2	0.4	0.4	-2.9	0.3	-3.8	-0.7	20.1	34.7	-5.5	0.1	-2.0	-2.6	-4.3	-2.3	-1.9	-0
Malawi	0.9	-1.9	2.2	-4.4	-0.1	-0.5	-1.2	11.0	26.7	-8.5	-1.0	-4.3	-4.8	-9.6	-1.4	0.8	-5
Zambia	0.4	0.1	0.1	0.1	0.0	0.1	-0.2	-4.1	-0.4	-6.2	-0.2	0.1	1.3	-0.5	0.3	2.1	4
Bulgaria	0.4	0.4	0.3	0.3	0.4	0.1	0.0	-2.5	-5.7	1.6	-0.1	0.3	0.4	0.1	0.3	0.1	0
Rest of South Asia	0.0	-0.1	0.8	-2.2	-0.4	-2.3	-0.4	4.5	24.4	-9.7	-2.2	-3.4	-3.9	-7.4	-1.1	-7.1	-1
South East Asia	0.0	1.0	1.0	-1.8	0.4	-1.2	-0.7	10.2	17.2	21.0	4.2	-2.1	-3.5	-4.6	-1.2	-2.2	1
Central America and the Caribbean	1.1	0.4	0.3	-4.4	-0.6	-3.4	-1.1	24.5	11.0	-4.3	-1.6	-4.3	-6.9	-7.3	-3.3	-4.5	-0
Andean Pact	1.2	0.1	0.1	-0.7	0.1	-0.2	0.1	3.6	4.3	-1.0	-0.1	-0.6	-0.5	-0.1	0.0	-1.0	-2
Argentina, Chile & Uruguay	8.4	-2.5	-1.1	-3.3	-0.1	-5.4	-2.5	-7.1	-3.7	-9.8	-2.0	-4.1	-5.4	-9.3	-2.8	-0.7	2
Middle East and North Africa	0.7	0.3	0.2	0.3	0.8	-0.4	-0.3	-3.0	-1.4	-3.0	1.4	0.2	-0.3	2.1	-0.6	-2.2	0
Sub-Saharan Africa	0.6	0.9	0.8	-0.1	0.4	0.0	0.1	0.3	2.3	-7.0	0.2	1.7	0.9	1.0	0.2	-0.8	3
Rest of the World	0.5	0.8	0.6	-0.1	0.4	-0.4	-0.1	0.4	0.7	-1.7	0.1	0.5	0.1	0.9	-0.1	-0.3	0

Source: GTAP G5 database. UNCTAD calculation